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The General Staff of the Armed Forces of the USSR
Main Intelligence Directorate

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American Aggression In Southeast Asia

The Closing Stage of the War

Some Results and Conclusions

Part 7

[Illegible stamp]

Moscow -- 1977

Reviewed by DPMO
IAW 50 USC 435 Note & DOD 5400 7-R
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[TFR 210-2]

Volume No 1

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The air battle began on 4 April 1965 at the moment when the flight commander, Captain Khan', first discovered four enemy F-105s at a distance of 12 kilometers while flying beneath the edge of the clouds The enemy was flying at an altitude of 3,000 meters in a "column of pairs" formation, banking to the left After forming up and releasing their auxiliary fuel tanks, the Democratic Republic of Vietnam (DRV) fighters increased to maximum speed and dove to attack the enemy planes At the time of the attack, their speed was 1,000-1,040 kilometers/hour They opened fire from a distance of 600-500 meters During the air battle, the flight commander, Captain Khan', observed his tracers and their damage to an enemy plane The American fighter attempted to move away from Khan's fire by banking left, but was hit on the second pass from a distance of 200-100 meters The lead aircraft's wingman covered him and the attack failed The second flight of Vietnamese pilots attacked two other F-105s, one of which was hit and went down into the sea

[text missing]

The second and third air battles were fought on June 4 in the area of Vu-Ban (province of Khua-Bin') and on 17 June 1965, in the area of Nin'-Bin' On the Vietnamese side, one flight of MiG-17s participated in each of the battles One the American side, two of the three F-4H aircraft participated in the second battle, and one flight of F-4Hs in the third battle

At the beginning of the second air battle, the lead MiG-17 opened fire twice on the American planes the first time was from a distance of 1,200-1,000 meters, and the second time was from a distance of 700 meters The F-4H aircraft constantly changed altitude and banked, trying to avoid fire and jockey for better position to launch missiles One American fighter attempted to attack the lead MiG at a distance of 400-600 meters from above and behind However, his wingman unleashed a barrage of bullets from a distance of 400-500 meters and the American pilot decreased his altitude, banked, and disengaged from battle Another American fighter followed him The Vietnamese believe that the lead American aircraft was hit and crashed in the territory of Laos At approximately the same time, Vietnamese fighters attacked another flight of aircraft, but the American pilots did not engage, instead, they reduced altitude and departed in a westerly direction

The third air battle was considerably more fast paced, and during this battle two American F-4H aircraft were shot down The Vietnamese aircraft attacked from the rear The American aircraft were fired upon from distances of 600 to 100 meters The American pilots engaged in battle reluctantly, and tried to flee towards South Vietnam in a disorganized manner

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According to the High Command of the People's Army of Vietnam (PAVN), pilots of the DRV suffered no losses in this air battle However, only one aircraft returned to its airfield Two others crashed when their pilots bailed out after expending all their fuel, and one made a forced landing on the airfield at Khajfon [Haiphong] In this battle, as earlier, the combat formations of the Vietnamese pilots were disrupted and command and control of the flight was lost

Another air battle occurred on 20 Sep 65 above the area of the railroad station at Kep (60 kilometers northeast of Khanoj [Hanoi]) On that day, a standby flight of MiG-17 aircraft was ordered to Readiness Level 1 and launched from Noj-Baj airfield to repulse a raid by American fighter-bombers After takeoff the wingman, having become separated from the lead aircraft, climbed to an altitude of 6,000 meters and proceeded to a confrontation with the enemy He was directed with assistance from radar station P-35 A pair of F-4B aircraft was patrolling at that time at an altitude of 3,000-4,000 meters Upon seeing the enemy aircraft, the lead MiG-17 descended and attacked from the rear with an angle of approach of 2/4 on the wing F-4B, which was making a bombing run on the railroad The MiG opened fire at a distance of 500 meters The American aircraft made a left turn, decreased altitude and began to escape from under fire The Vietnamese pilot followed the enemy and fired on him a second time from a distance of 400 meters Smoke was coming from the American F-4B fighter, but it continued flying It was shot down by a third long burst of fire at a distance of 200 meters The crew of two was killed when the aircraft crashed into the ground

At the same time, a second pair of MiG-17 aircraft was caught in a battle at an altitude of 3,000 meters when one of a pair of F-4B aircraft came out of a dive after an attack, and the second was just beginning to dive to drop its bombs The MIG flight commander attacked the aircraft just coming out of its dive He opened fire at a distance of 1,000 to 1,200 meters The American aircraft, noticing the attack, did not engage in combat and broke away from the attacker by increasing speed

Air combat in 1965 showed the possibility of successfully using subsonic MiG-17 fighters against supersonic F-105 and F-4H aircraft It was discovered that the weak points of the F-105 were its great sluggishness and lack of maneuverability American pilots in air combat used defensive tactics and attempted as quickly as possible to escape combat The success of the Vietnamese fighters may be explained above all by the suddenness of their attack, and by the fear of the American pilots to conduct active, offensive battle

Air combat also revealed an inadequate level of pilot training in the Vietnamese air force, especially in group flight and in being able to maintain assigned combat formations until the end of the battle Directing the MiG-17 fighters to the target by ground radio proved successful, but during air combat, directing aircraft in the air failed

After these air battles the USAF command strengthened aviation assets in South Vietnam in both quantity and quality An additional thirty-six F-104 fighter-interceptors and ten F-4

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fighters were deployed to airfields in Thailand and South Vietnam On 19 Jun 66 F-104 fighter-interceptors began flying air cover for fighter-bombers during air raids on targets in the DRV Also, several [page ends in mid-sentence, sentence is not continued on next page]

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The first air combat between a MiG-21 and an American F-4C "Fantom" [Phantom] fighter occurred on 23 Apr 66 On that day, two MiG-21s attacked four F-4Cs that were escorting RB-66 aircraft equipped with electronic equipment for radar jamming The MiGs dived to attack the "Fantoms" [Phantoms], but the American pilots suddenly veered off and attacked, trying to get on the tails of the Vietnamese fighters in order to attack them with their "Sajdvinder" [Sidewinder] missiles One of them was successful in getting behind a MiG-21 and launching two missiles, which missed The second attack by a "Fantom" [Phantom] with two missiles was also unsuccessful

At almost the same time six MiG-17s began a battle with four other American F-4C fighters which were escorting 16 "Tanderchif" [Thunderchief] aircraft In this battle two American and two North Vietnamese aircraft were shot down After this battle the American pilots reported that the Vietnamese fought with great skill Evaluating the MiG-17 fighter, they reported that it was more maneuverable than the F-4C, but lagged behind it in diving and climbing ability

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[TFR 210-6]

Volume No 2

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On 19 June 1966, while on patrol in the air over Noj-Baj airfield, a pair of MiG-17s discovered two F-105s moving in for an attack to their rear and below them The North Vietnamese pilots made a vigorous turn, gained altitude, avoided the enemy fire and decided to attack the fast moving enemy aircraft Maneuvering between the peaks of the Tam-Dao mountain range, the lead MiG caught up with the lead F-105 and shot it down at a distance of 150 meters with his cannon The wing American aircraft would not enter the battle and fled to the west

Upon breaking off the attack, the wing MiG noticed another F-105 up ahead that was turning to the right He informed his lead aircraft The lead aircraft attacked the target, but was unable to damage it At that time his wingman attacked Closing with the enemy aircraft to a distance of 100 meters, he opened fire and shot it down with his cannon The air battle was fought at an altitude of 300-2,000 meters

In July 1966, North Vietnamese aircraft fought several more air battles with American aircraft at low altitudes of 50-1,000 meters On 7 July while on patrol over Noj-Baj airfield, the wingman of a pair of MiG-21s flying at an altitude of 200 meters noticed two F-105Ds on his right front, headed north of the airfield at an altitude of 500 meters He closed with them and turned to the right as he began the attack The lead enemy aircraft quickly started to gain altitude As he followed it, the MiG pilot fired a first burst of S-5 shells at the enemy from a distance of 1500 meters Continuing to close to a distance of 500 meters, he fired a second burst at the American aircraft, and at an altitude of 1,700 meters shot it down with a third burst from a distance of 150 meters In all, 12 S-5 shells were expended The lead MiG was armed with two R-3s missiles, but was unable to fire them because the wing American aircraft continuously maneuvered to get out of the zone of fire

On 13 July 1966, the Command Post scrambled a flight of MiG-17s from standby aircraft to repulse a raid of 12 low flying A-4 dive-bombers on the bridge across the Red River at Khung-En The North Vietnamese approached Khung-En at a low altitude and suddenly attacked the group of American strike aircraft During the first attack they shot down two A-4 aircraft with machine gun fire The bridge strike was aborted After hurriedly dropping their bombs, the low flying dive-bombers fled towards the sea Upon exiting the attack, the first pair of MiG-17s was attacked by a covering group of eight F-4B fighters One of the F-4Bs attacked the lead MiG and shot it down with a salvo of rockets However, in the meantime, he came under fire from the wing aircraft and was shot down by cannon fire The air battle was fought at an altitude of 50-500 meters

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Several successful battles by DRV fighters also took place in August 1966 An air battle occurring on 12 August was typical During this battle, a pair of MiG-17s attacked four F-105s using salvos of cannon fire and shot down one of them Besides that, the MiG-17 attack provided cover for two MiG-21 aircraft, which were making their usual patrol above the attacking group

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On 18 August, during a period of active operations by American aircraft against ground targets in the vicinity of Noj-Baj airfield, a flight of MiG-17 aircraft on standby was ordered aloft Immediately after forming up the North Vietnamese fighters attacked a group of American aircraft consisting of eight F-105s In a short air battle at an altitude of 500 meters, one F-105 aircraft was shot down, and the remaining aircraft, having prematurely dropped their bombs, withdrew towards the west at an accelerated speed The North Vietnamese did not suffer any losses in the air battle, but one aircraft was shot down by its own antiaircraft artillery on entering the airfield defense zone

A similar incident occurred on 22 August On that day, two pairs of MiG-17s patrolling near Noj-Baj fought three air battles with three groups (12 aircraft) of F-105s Two F-105s were shot down during these battles The enemy aircraft attacked from a distance of 400-500 meters with cannon fire The battle took place at low altitude Upon returning to the airfield the first pair of North Vietnamese fighters were fired upon by their own antiaircraft artillery The wing aircraft was shot down [page ends in mid-sentence, sentence is not continued on next page]

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In September 1966 the air war over the DRV was as intensive as it had been in August On 5 September, American aviation was especially active in the region of Fu-Li (55 km south of Khanoj [Hanoi]), attempting to destroy the rebuilt bridge across the Song-Daj River At 1630 hours, P-30 radar detected a group of aircraft _ towards Fu-Li A pair of airborne MiG-17 fighters received a command from the Command Post to intercept the enemy aircraft

While heading towards the designated region, the North Vietnamese pilots discovered two F-8 aircraft at an altitude of · -2,000 meters Apparently the F-8 pilots noticed the MiG fighters and hid themselves in the clouds Knowing that American aircraft headed towards the sea in similar instances, the North Vietnamese also flew east and climbed to an altitude of 6,000 meters Soon the American planes emerged from the clouds and appeared 600 meters in front of the MiGs After banking and closing the distance, the lead North Vietnamese aircraft opened fire on the enemy wingman at a distance of 500 meters He missed, but after two subsequent passes at a distance of 300-400 meters the aircraft was shot down At almost the same time the second MiG, by order of his commander, attacked and shot down the leader of the American planes at the same distance with rounds from his cannon Success was attained because the North Vietnamese pilots figured out the Americans' maneuver and made the correct decision about their direction of flight

On 16 September, four North Vietnamese MiG-17Fs conducted a successful low-altitude air battle against eight F-4Cs The DRV fighters met the enemy in the area of Khaj-Duong suddenly while pursuing a fleeing group of attack aircraft that was escaping towards the sea Possessing a two-fold superiority in numbers, the American pilots entered into battle Maneuvering in the horizontal plane at speeds up to 900 kilometers an hour, they launched 12 air-to-air missiles at the North Vietnamese fighters, but not one of them hit its target The missiles were launched simultaneously The MiG-17 fighters, taking advantage of their superior horizontal maneuverability, turned inside the enemy They shot down two F-4Cs and damaged one with a salvo of cannon fire from a distance of 200-250 meters

The North Vietnamese victory in this air battle can be attributed to strict maintenance of their formation, informing each other in a timely manner of missile fire from the enemy fighters, and skillful exploitation of the maneuverability of their aircraft

On 21 September a flight of MiG-17s conducted an air battle in the Kep airfield area with a group of American planes (eight F-105s and four F-4Cs) During the battle cannon fire destroyed one F-4C and one MiG-17 (shot down by an F-105) The North Vietnamese pilot ejected The air battle took place at an altitude of 300-1,500 meters

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Eight air battles were conducted in October 1966 The most successful were those occurring on 5, 8 and 9 October

On 5 October at 0900 hours, a flight of MiG-21s from the 921st Fighter Regiment took off from Noj-Baj airfield to destroy two RB-66 aircraft conducting jamming operations While being guided to the target, the pilots received ranging data on the location, altitude, and direction of flight of the enemy aircraft, since their plan position indicators were being jammed This permitted the aircraft to overtake and attack their target An RB-66 was destroyed by two R-3s missiles The missiles were launched from a distance of 3,000-3,500 meters at an altitude of 1,000 meters

On 9 October at 0750 hours two MiG-21s were dispatched to repel a flight of 28 F-4s and F-8s, located near Khao-Bin' (50 km southwest of Khanoj [Hanoi]) Having approached the designated area at an altitude of 3,000 meters, the North Vietnamese pilots carried out several attacks on the enemy aircraft They shot down two F-4s with 20 S-5m rounds, and their pilots were taken prisoner In the same battle, one of the North Vietnamese pilots was shot down by "air-to-air" missiles

On the same day at 0900, a pair of MiG-17s from the 923rd Fighter Regiment was dispatched to the same region After visually sighting two A-1Hs and four F-4Hs at a height of 2,000 meters, the MiGs engaged them in a dogfight During the battle one A-1H was shot down by salvos of cannon fire In turn, the MiGs were attacked by the F-4Hs One MiG-17 was shot down by an air-to-air missile The pilot ejected

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On 2 December, 10 MiG-21s from the 921st Fighter Regiment were scrambled to repulse an attack by several groups of American aircraft coming from Thailand In order to provide cover for Noj-Baj airfield, 18 MiG-17s from the 923rd Fighter Regiment took off (from Gia-Lam airfield) The encounter aircraft, which included 38 F-105s and 10 F-4Cs, occurred directly above the objective of their attack The DRV pilots attacked the first two groups and shot down two American aircraft with eight R-3s missiles The American pilots launched two missiles at the MiGs, but neither one of them hit its target The DRV pilots' attacks occurred simultaneously with intense fire from air defense artillery and anti-air missiles In all, 12 US Air Force aircraft were destroyed that day Many American pilots dropped their bombs haphazardly and hurriedly departed towards Thailand

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On 5 December 1966 three pair of MiG-21s took off to intercept enemy aircraft (up to 16 F-105s) They shot down two F-105s with R-3s missiles The remaining F-105s were forced to drop the rest of their bombs haphazardly and return to their base Their attack was completely disrupted The enemy was intercepted 30-50 kilometers from the objective, outside the reach of air defense artillery and antiaircraft missile troops The R-3s missiles were launched using an optical sight while the aircraft were on afterburner traveling at speeds between 1,000-1,200 kilometers/hour The aircraft were guided from the ground by transmitting information about the target's location, followed by independent search using visual observation

On 8 December 1966, two pairs of MiG-21s took off to repel the attack of a group of 16 enemy F-105s headed towards Noj-Baj airfield The encounter between the MiGs and the enemy aircraft took place 70 kilometers northwest of Khanoj [Hanoi] at an altitude of 3,000 meters on intercept courses The MiGs turned around, got behind the American aircraft and began their attack Subsequently, the North Vietnamese pilots launched four R-3s missiles and shot down two F-105s

As the attack began, the enemy aircraft immediately dropped the rest of their bombs, descended on afterburner and rapidly began heading towards Laos

[text missing]

On 13 December 1966 from 1505 to 1530 hours, 8 MiG-21s and 8 MiG-17s from the 921st Fighter Regiment were dispatched to repel the attack of a group of enemy aircraft, composed of 50 F-105s and F-4Cs and 40 A-4s, F-8s and F-4Bs Four MiG-17s also deployed to cover the 923rd Fighter Regiment's airfields The first three groups of enemy aircraft were intercepted and attacked by the MiGs During the attack, an R-3s missile brought down an F-105, and the others turned around 12 enemy aircraft of the following groups broke through to Khanoj [Hanoi] and dropped their bombs on the railroad depot (at Gia-Lam) and on anti-aircraft artillery positions on the outskirts of Khanoj [Hanoi]

On 14 December 1966, from 1500 to 1615 hours, fighters from the DRV took part in repelling a massive attack on Khanoj [Hanoi], the capital of the DRV About 140 aircraft from the Air Force and Navy participated in the attack First, 14 MiG-21 PFLs and 16 MiG-17 Fs went out to intercept 60 fighter-bombers en route from Thailand During their encounter, 24 F-105s

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haphazardly dropped their bombs and withdrew During the pursuit that followed, the MiG-21s shot down two F-105s and one 147J unmanned reconnaissance aircraft During the battle, 5 R-3s and 28 unguided missiles were expended

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On 2 January 1967, a group of 54 American aircraft approached Noj-Baj airfield, where the 921st Fighter Regiment, equipped with MiG-21 PFLs, was based Of the 54 aircraft, 24 F-4Cs flew straight to the airfield while the remaining 30 aircraft with a slight lead flew towards the fuel depot at Tyun-Ze, simulating an attack The aircraft approached Noj-Baj airfield as usual from the northwest, but in a tight military formation, consisting of a column of flights The flights were about 600 meters apart, and the planes in each flight were about 200 meters apart

While approaching Noj-Baj airfield, the enemy fighters providing cover divided into several groups and started to patrol around the airfield in four separate zones in order better to observe

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the DRV fighters in case they took off In every zone 15 - 30 kilometers from the airfield, there were four fighters positioned at an altitude of 2,500 - 3,000 meters, while in the zones located 40 - 80 kilometers from the airfield, there were two fighters were positioned at an altitude of 4,000 - 5,000 meters (illustration 38) [not provided] Each aircraft in the cover group had up to four "Sajdvinder" [Sidewinder] and four "Sparrou" [Sparrow] missiles Their mission was to destroy DRV fighters at takeoff, while they were gaining altitude or while they were landing Since the cloud cover completely reduced visibility between 1,500 and 3,000 meters, the American pilots did not go below the clouds, but waited for the MiG-21s to appear above the clouds [1]

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[1] This data was provided by a captured American pilot who was shot down in an air battle on 1 June 1967

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In spite of the difficult and unfavorable conditions of the aerial situation for an air battle, the Central Command Post issued the command to deploy a second flight of MiG-21s Taking off 10 minutes after the first flight and against the clouds, it

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was also attacked by American aircraft One MiG-21 was shot down by the first series of missiles and the pilot ejected The other DRV pilots, having evaded the missiles, increased their speed and flew into a dogfight The remaining MiGs shot down two F-4Cs with two R-3s missiles and several volleys of S-5m fire The American pilots continued to attack They launched between six and eight missiles at each MiG, but this time not one of them hit its target In the nick of time, the DRV pilots noticed the launch of the missiles and evaded them with energetic maneuvers

This air battle was characterized by a large group of American fighters with the mission of destroying North Vietnamese aircraft in the air Additionally, several long-range radar detection aircraft, jamming aircraft, and helicopters of the U S Air Force Air Rescue Service provided support to the fighters' mission

The air battle of 6 January 1967 occurred in much the same manner as the previous one As a group of six American F-4Cs approached Noj-Baj, the acting commander of the 921st Fighter Regiment decided not to deploy his fighters Instead, he ordered the air defense artillery to repel the raid As the enemy aircraft reached the airfield and the 100-mm anti-aircraft cannons opened fire, the Central Command Post ordered a flight of MiG-21 PFLs aloft When they came out of the clouds, the MiG flight was immediately attacked by an enemy group of six F-4Cs coming from behind and above them (illustration 40) At a speed of

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approximately 1,200 kilometers/hour they launched 20 missiles at the MiGs and shot down two North Vietnamese fighters The pilots from the downed MiG-21s ejected, but one of them died since the main fastener on his parachute harness straps was unfastened He fell out of his harness as the parachute opened

The remaining DRV pilots turned and began an air battle The flight leader, Hero of the VNA Major Chan'-Khan', hit an F-4C with an R-3s missile The F-4C began to smoke and flew into the clouds After this, the Americans withdrew from combat The wreckage of the aircraft was located several days later This air battle took place at altitudes of 2,500 - 3,000 meters, above the clouds, about 60 kilometers from the airfield

In February 1967 fighters of the DRV air force conducted 58 missions, 32 of them at night, to protect objectives and repel American air attacks Fighter pilots from aviation units of the Democratic People's Republic of Korea conducted eight missions A flight of MiG-17s from the 923rd Fighter Regiment conducted an air battle (5 February) with four F-4Cs The encounter with the enemy fighters occurred in an area 50 kilometers southeast of Khanoj [Hanoi] After locating enemy aircraft at an elevation of 1,200 – 1,500 meters during a visual search, North Vietnamese pilots attacked one at a time with salvos of cannon fire The wingman of the second pair shot down one American aircraft

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Only one flight of MiGs was directly involved in the battle on 26 March The flight took turns attacking in pairs six American aircraft flying alone and in small groups As a result of the attack, one F-105 was shot down and one F-4C was severely damaged

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[page starts in mid-sentence] to stop U S aircraft attacks Thus, on 19 April, 24 MiG-17s and six MiG-21s were deployed against a group of 20 F-105s and F-4Cs In the group of fighters were eight MiG-17s piloted by Koreans The enemy attack was thwarted In the air battle, two American F-105s were destroyed and two A-1Hs were damaged All of the North Vietnamese and Korean pilots returned to their airfields Two MiG-17s sustained damage from cannon fire

On 24 April 1967, 16 MiG-17s participated in two air battles They shot down four American aircraft without sustaining any losses One of these aircraft was shot down by Korean pilots The battle occurred at altitudes of 600 – 2,200 meters, at speeds of 950 – 1,100 kilometers an hour with the application of horizontal maneuver

In this battle, the flight of DRV fighters succeeded under the command of Hero of the PAVN, flight commander Baj (drawing 41) [missing] The flight took off from an ambush from Kyn-An airfield (on the outskirts of Khajfon [Haiphong]) and headed toward the area of operations of American aircraft Soon Baj's pilots noticed several enemy aircraft on a collision course flying in a column of pairs The flight commander turned right on afterburner and approached the wingman of the first pair of F-4Hs From a distance of 300 – 200 meters he shot the enemy down with one burst of cannon fire, consisting of 34 23mm rounds and 11 37mm rounds The American pilots in the second pair noticed the attacking MiG and launched four air-to-air missiles from a distance of 3,000 meters Baj's wingman saw the missile launch and warned his commander by radio Baj dodged the missile with a hard turn to the right and a dive The missiles, continuing their flight, overtook one of their own aircraft (the leader of the team of F-4Hs), and shot it down After this, the second pair of American aircraft turned on their afterburners, climbed and withdrew toward the east while the MiGs successfully landed at Gia-Lam airfield

Ten groups, consisting of 72 Mig-17 and –21 fighters, participated in the next seven air battles on 25, 26 and 28 April

On 28 April at 1542 hours, two MiG-21s were deployed from Noj-Baj airfield to intercept an American RB-66 jammer that was flying at an altitude of 6,000 – 7,000 meters This directive came from the Central Command Post While still 35-40 kilometers from the RB-66 and about 80 kilometers from the airfield at an altitude of 7,100 meters, pilot Kyong saw two F-105s to the right rear and 300 – 500 meters below his aircraft on a pursuit course After reporting this to the Central Command Post, the MiG pilots maneuvered behind the American aircraft The leader launched an R-3s missile at the F-105 wingman at a distance of 1,200 -- 1,400 meters and a speed of 1,100 kilometers/hour However, since the missile was launched during a turn by a maneuvering aircraft, it went past its target Then the MiG wingman started to attack He successfully launched one R-3s missile and shot down the F-105 wingman The fighters were unable to intercept the jammer aircraft

On 30 April at 1620 hours a pair of MiG-21s took off from Noj-Baj airfield to destroy American aircraft operating in the area of Fu-Tkho (the leader was Senior Lieutenant Khueh, the

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wingman was Senior Lieutenant Din') On this day, the weather was partly cloudy, the lower boundary of the clouds was about 3,200 meters, and visibility was 10 kilometers Target designation came from the Command Post of the 921st Fighter Regiment At a distance of 90 kilometers from their airfield, the North Vietnamese pilots saw two F-105s at a distance of 5 - 6 kilometers, traveling at an altitude of 3,000 meters on a converging course The enemy also noticed the approaching MiGs and started to turn to the left,

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clinging to the lower edge of the clouds In the ensuing air battle, the MiGs initiated an attack on the American aircraft Senior Lieutenant Khuehn, who was at a distance of 1,500-1,700 meters and traveling at a speed of 1,000 kilometers/hour, used an optical sight and launched a missile at the lead aircraft of the F-105 pair Since both the attacking and attacked aircraft were still turning, the missile went past the target low and to the right by 100 meters Senior Lieutenant Din', taking aim with a radar sight, launched a missile at the wingman from a distance of 1,500-1,200 meters The missile flew into the engine nozzle and the F-105 exploded in midair Senior Lieutenant Khuen's second attack was successful His missile also entered the engine nozzle of the F-105 and it blew up The pilot ejected and was taken prisoner

During the air battles in April, North Vietnamese and Korean pilots shot down 22 American aircraft The most effective battle was on April 28, when a group of eight MiG-17s that took off to stop an attack on Khajfon [Haiphong] shot down four American F-4Hs and A4s

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Cargo arrived in Dong-Fong-Tuong by railroad from the Khanoj [Hanoi] region, and on ships and by coastal barge from the Khajfon [Haiphong] region

The 77th Carrier Strike Force was given the task of destroying depots and communications nodes The attack was planned by the staff of the strike force commander, Rear Admiral D Richardson Air attack wings from the Kitti Khok [Kitty Hawk], Koral Si [Coral Sea], and Tikonderoga [Ticonderoga] participated in the attack (Fantom [Phantom], Krusejder [Crusader], Skajkhok [Skyhawk] and Intruder aircraft)

The primary objectives of the attack were bridges, a 70-meter ferry crossing and depots The attack took place over two days

The 9th Air Wing from the aircraft carrier Tikonderoga [Ticonderoga] carried out the attack on the first day

The 192nd Ground Attack Squadron attacked a railroad bridge Two groups attacked the bridge The first group used a guided missile, the Bullpap [Bullpup], and the second group used 1,000-pound bombs Two pairs of ground attack aircraft from the squadron were tasked to suppress the primary air defense artillery and antiaircraft sites providing cover for the bridge with missiles and bombs

The 194th Fighter Squadron attacked a railroad spur One fighter from the squadron was tasked to cover a reconnaissance aircraft photographing the results of the attack

The next day, after examining the results of the attack and intelligence assessments of the Dong-Fong-Tuong region, the 85th Ground Attack Squadron of Intruders from the aircraft carrier Kitti Khok [Kitty Hawk] attacked an alternate railroad bridge with 1,000-pound bombs The ground attack aircraft approached the bridge at a relatively low altitude, which complicated the task of the weakened air defense system Nonetheless, one Intruder was shot down As a result of the strike, one bridge span was destroyed

[text missing]

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[TFR 210-22]

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[text missing]

On **20 August 1967** at 1213 hours, a pair of MiG-21s was dispatched from Noj-Baj airfield to intercept a group of American aircraft headed toward Fu-Lo (75 kilometers to the northwest of Khanoj [Hanoi]) After climbing to an altitude of 5,000 meters, the aircraft headed toward the V'et-Chi area From there, based on orders from the Central Command Post of the air defense and air forces of the PAVN, they started to maneuver to the rear of the last aircraft of the group of American aircraft Due to jamming, the Central Command Post could not provide precise guidance and directed the fighters to a position 20 kilometers from the enemy The pilots reported by radio that they could not locate the enemy aircraft After that, guidance was passed to the regimental command post On the orders of that command post, the fighters dropped to an altitude of 2,500 meters and went off to attack another group of aircraft

At 1225 hours, the wingman of a pair of North Vietnamese fighters saw two F-4s ahead and to the right He reported this to the lead aircraft and asked for permission to attack After receiving permission, he closed the distance to the group of enemy aircraft and launched an R-3s missile from a distance of 1,500-2,000 meters that blew up before it reached the target

After witnessing the missile explosion, the American pilots increased their speed, changed course and started climbing Intercepting them, the wingman of the North Vietnamese pair launched a second missile from a distance of 1,500-1,800 meters that exploded underneath the wingman's F-4 Aircraft The American aircraft caught fire and fell into the jungle in the southern foothills of the Tam-Dao mountain range, 40 kilometers from Noj-Baj The missile was launched while at a speed of 1,200 kilometers/hour and an altitude of 3,500 meters

On **23 August 1967** a pair of MiG-21 fighters intercepted a group of eight F-105s, traveling from Laos towards Tujen-Kuang Their encounter with the enemy aircraft occurred 10 minutes later after they climbed to an altitude of 4,000 meters The MiG leader decided to attack the approaching flight of enemy aircraft, but then his wingman radioed that a group of 12 F-4s was coming up behind and 1,000 meters below them The North Vietnamese fighters turned to the right and, allowing the enemy aircraft to go ahead, with a left turn moved to the enemy's rear The American aircraft were formed into a column of flights, three kilometers apart Each flight was in a "wedge" formation The distance between the closing F-105s and the leading F-4s was about 10 kilometers

Apparently, the American pilots did not notice the MiGs and continued on their initial course at a speed of 800 kilometers/hour

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Occupying their point of departure for the attack, the North Vietnamese pilots turned on their afterburners, and started to close the gap in a "front" formation Turning to the right and decreasing their altitude, they attacked the approaching flight of F-4s They launched their missiles at an altitude of 5,200 meters at a speed of Mach 1 2-1 3 from a distance of 1,800-1,500 meters (first missile) and 800 meters (second missile) Both missiles reached their targets and two F-4s were shot down

After the first missile launch, the North Vietnamese fighters again turned 15-20 degrees to the right and, traveling higher than the approaching flight, attacked and shot down with another missile a second F-4—the wingman in the second pair of the lead flight The second missile was launched from a distance of 1,500-1,200 meters at a speed of Mach 1 2 at an altitude of 500 meters In both instances a PKI sight[2] was used

The leader of the North Vietnamese pair of aircraft exited the attack by turning right into a 60-degree dive while the wingman made a combat turn and climbed to 10,000 meters Having slowed down during his exit from the attack, the wingman flew into an area full of shrapnel from the F-4 missiles As a result, his aircraft sustained minor damage Both DRV pilots landed successfully at their airfield

On **31 August 1967** at 0935 hours two MiG-21s took off from Noj-Baj airfield to intercept an American reconnaissance aircraft flying out of Laos towards V'et-Chi

Carrying out commands from the Central Command Post, the North Vietnamese pilots climbed to an altitude of 6,000 meters and soon detected two RF-4s flying ahead of them about 1,000 – 1,500 meters lower on a course of 260-280 degrees in an "echelon" formation

The leader of the North Vietnamese pair ordered his wingman to attack the wing RF-4, while he attacked the lead RF-4

Apparently the American wingman noticed the MiGs He descended in a left turn to low level flight and was lost against the background of the jungle The flight leader continued his flight, making swift course and altitude changes

Approaching to within 2 5 kilometers of the enemy aircraft, the North Vietnamese pilot took aim with his RP-21 radar sight and launched his first missile He was flying at an altitude of 4,500 meters at a speed of Mach 1 2 The missile exploded near the enemy aircraft, but it continued its flight in a westerly direction, first reducing altitude

The North Vietnamese pilot continued the pursuit at 1,100 kilometers/hour at an altitude of 3,000 meters He launched the second missile from 1,500 – 1,800 meters The explosion of the missile caused the RF-4 to turn on its back, catch fire and crash to the ground at a 60-70 degree angle

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[2] Unknown breakout A kind of bomb sight on a fighter aircraft possibly a collimator sight —Translator

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On **9 October 1967** at 1010 hours, two MiG-21s were scrambled by order of the Central Command Post from Noj-Baj airfield to intercept U S reconnaissance aircraft flying enroute from En-Baj to Fu-To at an altitude of 9,000 meters

It was supposed that after reaching Fu-To, the enemy aircraft would fly towards V'et-Chi, and from there to Khoa-Lak airfield, as they had done before Thus, the alerted fighters were initially sent towards Son-Taj However, the American aircraft did not turn to the south after reaching V'et Chi Instead, they continued on their original course towards Noj-Baj airfield The North Vietnamese pilots then were ordered to turn to a heading of 70 degrees and increase their speed to 1,200 kilometers/hour

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While maneuvering, the wingman of the pair of MiGs lost the leader and returned to his airbase by order of the Command Post The leader continued his pursuit alone

After receiving information that the enemy was straight ahead at a distance of 20 kilometers, the pilot turned his RP-21 sight to "survey" and saw two targets on the screen, one at a distance of 18 kilometers, the other at a distance of 19 kilometers Immediately after that interference appeared on the screen of his radar sight and it became impossible to track the targets

Having increased its flight speed to Mach 1 4, the North Vietnamese fighter continued to close in on the enemy planes, which also increased their speed and began to maneuver From a distance of 8-10 kilometers, he switched his RP-21 sight to "lock-on," but intense jamming hindered his ability to initiate an attack

From a distance of three to four kilometers, the North Vietnamese pilot visually observed an F-4 and prepared to fire At an altitude of 7,500 meters, a speed of Mach 1 4, a distance of 1,500 meters, and holding a steady lock-on to the target with his thermal radiation detectors, he launched an R-3s missile at the F-4 The enemy plane was shot down

On **16 September 1967** over Khoj-Suan (105 kilometers SW of Khanoj [Hanoi]) at an altitude of 5,000 – 6,000 meters a group of enemy planes was discovered heading in the direction of Van-En (120 kilometers W of Khanoj [Hanoi]) Two MiG-21 fighters were ordered to intercept the group

The enemy planes turned right when they reached Van-En and flew in the direction of V'et-Chi As they approached it, they turned to the northwest and took up a course along the Khanoj [Hanoi] – Lao-Kaj railroad

At 1105 hours, by command from the Command Post, the North Vietnamese pilots began their pursuit of the enemy When the American reconnaissance aircraft descended to an altitude of 5,000 meters and turned to the south at the Bao-Ma railway station, an order was issued from the Command Post at 1110 hours "Assume a course of 210 degrees " After turning, the MiGs found themselves 20-25 kilometers to the left and several kilometers behind an RF-101

About two minutes after the first order came the second "Course 250 degrees Enemy is 20 kilometers to the right Attack is authorized " Having changed their course, after about a minute the North Vietnamese pilots saw in front and to the right at a relative bearing of 30 degrees and a distance of 10 kilometers two enemy aircraft, that flew without maneuvering, not seeing the fighters

The leader of the MiGs reported to the Command Post that the target had been sighted, and ordered his wingman to drop his external fuel tanks, fire afterburners, and prepare to attack After jettisoning his tanks and going to afterburners, the leader increased his speed to 1,250

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kilometers/hour and began closing in on the wingman of a pair of RF-101s At a distance of 2,200 meters a signal light came on authorizing him to fire, but the North Vietnamese pilot continued to close in, choosing to wait for a better opportunity to attack When the enemy plane was 1,500 meters away, he launched an R-3s missile that struck the tail section of the RF-101 and exploded The enemy plane went down 25 kilometers northwest of Muong-Khung The pilot ejected and was captured

After that, the leader attempted to attack the second RF-101 However, the closing speed was high (250 – 300 kilometers/hour), and he was not able to sight the target very well Withdrawing from battle, the leader ordered his wingman to attack the RF-101 The wingman waited until the enemy turned, then launched an R-3s missile at him, which exploded under the right console of the wing and set the plane on fire The missile was launched at speed of 1,200 kilometers/hour from a distance of 1,500 meters

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Two days after this battle an American pilot was captured in the territory of the DRV He was the pilot of an RF-4 from the 432nd Reconnaissance Air Wing, based in Thailand, who was shot down by a surface-to-air missile The captured pilot stated that on 16 September 1967 two RF-101 aircraft from his squadron did not return from their mission The pilot of one plane ejected and landed on the Vietnamese-Laotian border, where he was later rescued by a helicopter The second pilot was considered killed in action

On **26 September 1967** two MiG-21s were scrambled to intercept a group of American F-4 aircraft coming from the direction of Laos at Tuen-Kuang

The Central Command Post directed the MiGs to a position at an altitude of 6,000 meters and to the rear of the enemy aircraft at a distance of 18 - 20 kilometers, in the region of En-Baj Subsequently, the DRV pilots managed to overtake the planes themselves, having increased their speed to 1,200 kilometers/hour Following a direct course of 30 degrees, they switched on their RP-21 sights and saw the targets on their screens, located 15 – 16 kilometers away However, interference appeared almost immediately on the screens of their radar sights As they approached the enemy aircraft, the jamming intensified sharply The pilots were forced to switch off their RP-21s and change to visual observation

At approximately ten kilometers away the leader noticed flying below and in front of him eight American planes, which were changing altitude and direction After reporting his discovery of the enemy, the leader of the pair of MiGs attacked In an moment of level flight by the trailing F-4, he targeted it with the PKI sight and launched an R-3s missile at a distance of 1,500 meters The missile exploded under the enemy aircraft, which caught fire and fell into the jungle about 20 kilometers southeast of Tujen-Kuang The missile was launched at an altitude of 4,200 meters and a flight speed of 1,350 kilometers per hour The pilot exited the attack with a left turn

On **29 September 1967**, a battle took place between MiG-21 fighters and carrier-based F-4B fighters

At 1450 hours, two MiG-21s took off to repel a raid by enemy aircraft flying in from the Gulf of Tonkin through Kam-Fa After take-off, the MiGs were directed by the Central Command Post to an intercept course of 80 degrees

On this day the cloud cover was five to seven units (cumulus, with a lower boundary of 4,500 – 5,000 meters and an upper boundary of 6,500 – 7,000 meters) Visibility was 10 kilometers

Fight minutes after take-off, the MiGs assumed a course of 30 degrees, and after 15 – 20 seconds assumed a course of 360 degrees The enemy aircraft were located under the clouds at that time, to the front and on the right, at a distance of 25 – 30 kilometers Flying on the same course for about two minutes, the MiGs flew abeam of the F-4s and passed them The Central

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Command Post ordered the planes to make a 30 degree banked turn While completing the turn, the wingman spotted a group of F-4s through a break in the clouds and reported this to his leader The latter gave the order to prepare to attack, dropped his auxiliary fuel tanks, turned on his afterburners, and began to move in for an attack on the flight of F-4s The American pilots did not notice the MiGs After maneuvering, the North Vietnamese pilot switched on his RP-21 sight, and as soon as he locked-on to the target, launched a missile at the left wingman of the F-4 flight The missile exploded under the enemy plane, which caught fire and began to fall

The DRV wingman, following his leader at a distance of 600 – 800 meters at an altitude of 4,900 meters, observed the attack No jamming appeared on the screen of the RP-21 sight

At 1529 hours, the MiGs landed at their airbase, having been in the air for 39 minutes

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On **30 September 1967**, at 1510 hours, two MiG-21s from Noj-Baj airfield were scrambled to intercept a group of American planes flying from the Gulf of Tonkin through Kam-Fa, heading towards Kep Station

After taking off and climbing to an altitude of 1,000 meters, the pilots received an order from the Central Command Post "Course 50 degrees Increase altitude to 5,000 meters " Approximately one minute after flying abeam of Kep airfield, the MiGs were directed to turn right to course 230 degrees After that the North Vietnamese pilots received an order from the Central Command Post "The enemy is ahead to left, distance 12 kilometers Attack!" The flight leader of the North Vietnamese fighters reported back to the Central Command Post "I cannot see the enemy The sun is interfering "

The pilots continued along the assigned course at an altitude of 5,000 meters Five to seven kilometer before they reached Kep, the wingman observed enemy planes bombing Kep airbase and reported this to his leader At the same time, the leader observed another pair of enemy planes bombing the Kep railroad station and reported this to his wingman

The flight leader turned left and descended to attack the nearest pair of F-105s In maneuvering to the rear of the attacking planes, he closed to a distance too small to permit him to launch missiles He did not launch his missiles, and as he banked left to pull out of his attack he simultaneously reported "Did not launch, distance too close, pulling out" after which communication with him was cut off

The North Vietnamese wingman decided to attack the rear wingman of the F-105s situated over Kep Airbase While turning he noticed two other planes, flying overhead 800 – 1,000 meters, on an intercept course At a height of 3,000 meters, he closed on the tail of an F-105 at a speed of 1,100 kilometers/hour From a distance of less than 1,500 meters, he targeted the plane on his PKI sight and launched an R-3s missile After this he banked hard to the right out of the attack and assumed a course back to the airbase During his maneuver, the pilot observed a burning enemy plane that crashed 15 kilometers SE of Kep Without encountering any more enemy aircraft, the wingman landed at the Noj-Baj Airbase at 1540 hours

On **3 October 1967** at 1100 hours, a flight of MiG-17s were scrambled from Gia-Lam airfield to intercept a group of enemy planes striking railroad bridges in the vicinity of Khajzyong Guidance (GW) came from the Central Command Post The weather in the area of the airbase was cloudcover – five to seven units, strati-cumulus, lower cloud edge approximately 1,000 meters, upper edge 2,300 to 2,400 meters Visibility was five to ten kilometers

After taking off on a course of 220 degrees, the flight assembled in a circle above the airbase and headed to the region of the great Khanoj [Hanoi] railroad bridge (across the Red River), then pierced the clouds on a course of 50 degrees Behind the clouds at an altitude of

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2,500 meters, the MiG flight commander observed two RF-101 reconnaissance planes 1,500 meters above his position The planes were on a right to left intersecting course The flight commander immediately reported this to the Central Command Post After receiving the order to attack, the flight banked left in the direction of the RF-101s The flight commander gave the order "Attack the enemy!" At this time the North Vietnamese pilots were at a distance of about 12 kilometers from the Americans, but had a good view of them

The reconnaissance planes, apparently not expecting an attack, flew past the Noj-Baj Airbase and, increasing their altitude, continued their flight in the direction of Tujen-Kuang At a distance of 40 – 50 kilometers from the Noj-Baj Airbase, the two RF-101s noticed the MiGs in pursuit and dispersed The leader banked left at 75 – 80 degrees, then, while changing course, and having switched on the active

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jamming and increased his speed, began withdrawing toward Fu-To The wingman, having turned left to 40 – 50 degrees while also changing course and increasing speed, switched on its jamming and headed in the direction of En-Baj while gaining altitude

The MiG flight commander ordered the leader of the second pair of MiGs to attack the wing RF-101, while he and his wingman continued to pursue the lead RF-101

20 kilometers northwest of Fu-To, the MiG flight commander and his wingman overtook the lead RF-101, who was flying at an altitude of 4,700 meters Approaching the plane from below and behind, he opened fire at a distance of 150 meters He shot down the aircraft with sustained bursts, using 57 rounds of 37mm ammunition and 190 rounds of 23mm ammunition

The leader of the second pair of MiGs, pursuing the RF-101 wingman, overtook it in the region 25 – 30 kilometers south of Tujen-Kuang Approaching it from behind and below, he opened fire at a distance of 200 meters He shot down the RF-101 using sustained bursts of 44 rounds of 37mm ammunition and 180 rounds of 23mm ammunition

The North Vietnamese pilots withdrew from their attacks on the RF-101s at a distance of 75 – 50 meters with a bank to the right, and increased their altitude to 7,400 meters

At 1348 hours on the same day, two MiG-21s were scrambled from Noj Baj airfield to intercept two American reconnaissance planes that were flying from the direction of the Gulf of Tonkin through Khongaj and Khaj/yong The planes were at an altitude of 7,000 meters heading in the direction of Khanoj [Hanoi] After take off, the North Vietnamese fighters continued their flight to an altitude of 4,500 meters When the enemy planes were 25 – 30 kilometers from Khanoj [Hanoi] intense jamming appeared on the screens of the radar stations servicing the Central Command Post, and directing the MiGs from a distance became impossible Then the North Vietnamese pilots received orders to assume a course of 180 degrees, turn on their afterburners after turning onto this course, and ascend to an altitude of 7,500 meters There the pilots were to conduct a visual search of the area for the enemy at an altitude of 7,000 meters, ahead and to the left

While carrying out this command, at 1354 hours the MiG pilots, at a height of 7,500 meters, observed ahead and to the right, four enemy aircraft, flying 500 – 800 meters below them The planes were 10 – 12 kilometers away and flying on a course to the southwest The leader reported this to the Central Command Post, and after receiving permission for an attack, gave the command to his wingman All this time the enemy planes were adjusting their altitude and course The North Vietnamese pilots closed with the enemy at a speed of Mach 1 3 – 1 4

At a distance of 30 – 40 kilometers from the Laotian border a North Vietnamese fighter approached the tail aircraft of a pair of F-4s at a distance of about two kilometers Locking on with his PKI sight, he launched a missile and shot down the American plane

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On **7 October 1967** at 0739 hours, two MiGs were scrambled from Noj Baj airfield to intercept a group of U S Air Force aircraft The aircraft were flying out of Laos through En-Chau toward Fu-To at an altitude of about 4,000 meters

After take off, the planes headed for the Sontaj region, where they climbed to 5,000 meters Upon their departure to this region at an altitude of 5,000 meters, the North Vietnamese pilots received an order to "Assume a course of 310 degrees " At this time the group of enemy planes, still 20 – 25 kilometers from the Khanoj [Hanoi] – Lao-Kaj railroad, turned right and continued their flight in the direction of Khoa-Lak Airbase

Flying with a course of 310 degrees for 1 minute 30 seconds, the North Vietnamese pilots received the command "Turn left to 180 degrees The enemy is located 12 kilometers away from you, at an altitude of 4,000 meters, ahead on the left " Upon turning, the pilots discovered a group of the enemy, consisting of 12 F-4 aircraft flying in a " wedge of flights" formation They reported this to

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the Command Post and received permission to attack After giving the command to attack the enemy to his wingman, the lead fighter turned on his afterburners and closed in on the tail F-4 of the enemy flight on the right The American pilots probably did not see the MiGs, as they did not react to the maneuver from the rear

The leader of the pair of DRV fighters, after closing to within 1,800 – 1,500 meters of the tail F-4 of the enemy flight on the right, aimed with his ASP-5 and launched one R-3s missile The attack occurred at an altitude of 4,200 meters, at a speed of 1,200 – 1,250 kilometers per hour The exit from the attack was to the left and with an increase in altitude

The wingman observed the impact of the missile on the enemy plane, which caught fire and went down 30 kilometers west of the Khoa-Lak Airbase He also observed that on his left front a pair of F-4s from the enemy's left-hand flight was beginning to turn in the direction of the commander's plane as it exited the attack The wingman warned the commander of this With a sharp turn to the left, the North Vietnamese fighter escaped a missile launched at him by the enemy, then banked right and increased altitude as he left for his airbase

The wingman, who during this time had been closing with the right-hand flight of F-4s, turned his aircraft left after witnessing the attack of the two F-4s on his commander Having locked on, launched an R-3s missile at the lead aircraft of the attacking pair of F-4s He then turned left and gained altitude to leave the attack The F-4 shot down by the North Vietnamese fighter fell 20 kilometers west of the Khoa-Lak Airbase

On **9 October 1967** at 1525 hours, two MiG-21 fighters from Noj-Baj Airbase were dispatched to intercept U S Air Force aircraft flying at an altitude of from 3,000 – 4,000 meters from the direction of Laos, across En-Chau, in the direction of En-Baj By order of the Command Post, the MiGs were sent to an altitude of 5,000 meters, to the rear of the group of enemy aircraft about 10 kilometers away, in a region 30 kilometers WSW of Bak-Kan

Soon the North Vietnamese pilots spotted the enemy group of 16 F-105s flying in front of them, they were heading in the direction of Bak-Kan in a "diamond " formation, with each flight in "wedge" formation The lead and lefthand flights of F-105s were at an altitude of about 4,000 meters The right and rear flights of F-105s flew with a vertical separation of 800 – 1,000 meters relative to the lead flight

The leader of the pair of DRV fighters requested permission to attack The Command Post authorized an attack, but warned the pilots of another enemy group of perhaps eight F-4s about ten kilometers ahead of the group of F-105s

The lead pilot commanded his wingman to attack the left flight, and flew in to attack the rear flight of F-105s himself At an altitude of 3,500 meters, a speed of 1,000 – 1,100 kilometers per hour, and a distance of 3 – 2 5 kilometers, he launched a missile at the leader of the second

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pair of the rear flight of F-105s The missile passed below the enemy's wing and exploded about

one kilometer in front of him The flight of F-105s began to turn right, dropping their bombs in disorder The North Vietnamese fighter turned left and, having locked on to the leader of the left flight of F-105s, launched his remaining R-3s missile at him from behind and below The distance was less than two kilometers, at an altitude 3,800 meters and a speed of about 1,200 kilometers per hour The missile exploded beneath the leader of the flight of F-105s

At this time the wingman, having locked on to the leader of the left pair of F-105s in the same flight, launched an R-3s missile, which exploded close to the attacked F-105 The MiG was at
an altitude of 4,200 meters, at a speed of 1,200 – 1,250 kilometers/hour, and at a distance of less than 1,500 meters

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Both pilots exited their attack by increasing altitude to 8,000 meters They observed that the enemy planes dropped their bombs in disarray and fled to the southwest

On **16 January 1968**, a group of eight American F-4Cs appeared from the direction of Laos It was traveling at an altitude of 3,500 meters in a right echelon formation of wings, each wing in a "wedge of aircraft" formation Radar stations at this time observed active interference of medium intensity

Two MiG-21 fighters took off to intercept the enemy aircraft Afterburners were used during take off After take off, the MiGs flew on course 220 degrees for two minutes, and course 260 degrees for four minutes, increasing their altitude to 6,000 meters An order was issued from the Command Post "Target is ahead to the left at a range of 15 kilometers Use afterburners " After this, the pilots saw to their left front the flight of F-4Cs, on an intercept course at an altitude of 3,500 meters The leader performed a half-roll and came up behind the first pair of F-4Cs From a distance of 1,800 meters he locked on with his PKI sight and launched an R-3s missile, which struck the target and exploded

During this attack, a second pair of American planes came up behind the MiG leader, intending to attack him The wingman radioed a warning to his leader, and the North Vietnamese pilot energetically maneuvered to escape the enemy's pursuit, then headed back to his airbase His wingman simultaneously attempted to attack the second pair of American aircraft, but due to his great speed passed them by, and with an increase in altitude left the battle

This air battle is characteristic of the effectiveness of cooperation within pairs and good information on the aerial situation, which permitted the leader of the North Vietnamese pair to escape the attack of the American pilots

On **23 February 1968**, at 0642 hours, a single DRV pilot took off from the Noj-Baj Airbase in a MiG-21 He was ordered to attack a group of 12 American F-4Cs heading from the Gulf of Tonkin at a height of 4,000 – 5,000 meters to attack Kep Airbase The weather on this day was Cloudcover – ten units (height of the lower edge of the clouds was 700 meters, upper edge of the clouds was 2,200 meters), visibility 12 – 15 kilometers

After take off the pilot flew on course 120 degrees and, having broken through the clouds, increased his altitude to 5,000 meters After 5 minutes he changed course to 360 degrees and 2 minutes later, to his right and below, at an altitude of 4,000 meters and a distance of 12 kilometers, he observed a flight of F-4Cs flying in a "column of pairs" formation The North Vietnamese pilot turned on his afterburners and, at a speed of 1,300 kilometers/hour, began to overtake the enemy When he got to within four kilometers of the trailing pair of aircraft, they began to perform a "scissors" maneuver Having closed to within 1,500 meters of the F-4s, the North Vietnamese fighter locked on with his PKI sight and launched a missile, which struck the leader of the second pair The American plane caught fire and fell to the ground The

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North Vietnamese pilot made a combat turn to the left and at 0714 hours landed back at his airbase with 700 liters of fuel remaining in his tanks

Combat control and guidance in air combat originated from the Central Command Post in the presence of radar interference of weak intensity Since the command from the Central Command Post for the standby aircraft to take off was delayed, he was not able to reach the enemy aircraft until after their attack on Kep Airbase

On **7 May 1968**, at 1420 hours, a pair of MiG-21 fighters was scramble to intercept an A-3D aircraft flying from Tan'khoa with a course of 270 degrees and an altitude of 500 meters

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After taking off from Noi-Bai airfield, the pilots pierced the clouds, climbed to an altitude of 10,000 meters, and assumed a course of 180 degrees After 16 minutes of flight time, on orders of the Command Post, they turned left 30 degrees and descended to 7,000 meters, and then on a course of 80 degrees they descended to 5,000 meters At the same time the American aircraft ascended to 4,500 meters and turned right at a speed of 700 kilometers/hour The North Vietnamese pilots observed him visually at a distance of 12 kilometers and moved in to attack from above and behind Using his PKI sight, the leader launched an R-3s missile from a distance of 1,200 meters at a speed of 950 kilometers/hour and shot down the enemy aircraft After 54 minutes of flight time the pilots landed at their airbase with 400 liters of fuel remaining in their tanks

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On **23 August 1967**, at 1455 hours, a flight of MiG-17 aircraft flown by pilots of the KNDR [People's Republic of Korea] , was scrambled from Noj Baj airfield to provide cover for the airfield Positioned in a holding zone at an altitude of 500 – 1,00 meters, at 1519 hours the pilots attacked and shot down one F-105 aircraft flying over the airfield at an altitude of about 700 meters At 1522 hours the flight commander, together with his wingman, attacked a pair of F-4s which were pursuing a MiG-17 After closing with the American wingman at a distance of 350 – 400 meters, the flight commander fired a long burst (up to 70% of his ammunition) and set the aircraft on fire The burning American aircraft turned in the direction of the Tam-Dao mountain range, where it crashed into a mountain The second American aircraft broke off his pursuit of the MiG and flew in the direction of Laos

On **14 January 1968**, at 1530 hours a MiG-21, piloted by a Korean, took off from Noj-Baj airfield to intercept a flight of American F-4C fighters Four minutes after take off, following a course of 360 degrees, he climbed to an altitude of 9,000 meters Then, under orders from the Kep Airbase Command Post, he flew for four minutes on a course of 270 degrees While conducting his turn, the pilot observed below him at a height of about 500 meters a flight of enemy planes on a 150 degree course, flying in a "wedge of aircraft " formation Moving into a descent, the Korean pilot attacked the leader of the second pair of American aircraft At a speed of 1,150 kilometers/hour and from a distance of 2,000 meters, he targeted with his ASP-5nd and launched an R-3s missile The attacked American pilot attempted to escape from his attacker with a steep left turn and descent, but was hit and shot down

The Korean pilot banked left and climbed out of the attack to a height of 8,000 meters He landed at the Noj-Baj airfield at 1605 hours with 150 liters of fuel remaining

On **12 February 1968**, at 1526 hours, two MiG-21s, piloted by Koreans, were scrambled from Noj-Baj airfield to intercept a group of 12 F-4Hs They were flying at 4,500 – 7,000 meters altitude from the direction of the Gulf of Tonkin and heading in the direction of Tien-Lin, Din'-Lap After taking off, the fighters headed on course 345 degrees for three minutes, then turned right onto a course of 100 degrees while proceeding to climb to 9,500 meters for seven minutes After turning again to the right 30 degrees, the pilots turned on their afterburners and a minute later reported that they saw American aircraft below them on an intercept course While the MiGs began turning left, the wingman reported by radio "On the left below us are four F-4s I'm attacking " After a few seconds, when the planes were at an altitude of 13,000 meters going on a course of 280 degrees, he issued a second report "I see three F-4s below on the right " After this, communication with him was cut off Later, it was learned that in the battle the Korean wingman shot down one F-4, but while pulling out of his attack, he was attacked by three F-4s The plane was damaged and the pilot ejected During his descent to the ground the American pilots shot and killed him

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[TFR 210-33]

Volume No 4

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[IFR 210-34]

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[TFR 210-35]

Volume No 5

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On **21 January**, two MiG-21PFLs were ordered to destroy three American helicopters by the Central Command Post Seven minutes after take off, the Command Post clarified the position of the targets and reported the information to the leader, at the same time warning that the helicopters were operating with cover from other aircraft

While completing a turn to the right, the leader of the two MiG-21PFLs observed a pair of F-4 aircraft above him on the left To evade their attack, the leader turned on his afterburners and, continuing his turn to the right, gained altitude During this maneuver, the wingman fell 7 kilometers behind the leader, and having noticed an F-4 aircraft, with permission from his leader, attacked the American plane and shot it down However, he was subsequently attacked by a second F-4 and shot down

The leader, having observed the group of helicopters, attacked the nearest one The helicopter was shot down during the first attack by an R-3s missile The leader then received an order from the Command Post to break off his pursuit of the enemy and return to the airbase

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[IFR 210-37]

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[text missing]

According to data of the PAVN command, on this day the country's air defense elements shot down seven aircraft, including three B-52 bombers and one F-111A fighter, while repulsing an enemy air attack 69 anti-aircraft missiles were expended for that purpose

[text missing]

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In the Khajfon [Haiphong] region and its surroundings during the period from 1900-2200 hours, up to 30 aircraft carrier-based aircraft were carrying out strikes on a shipyard, a railroad station, residential areas, a bridge south of the city, and the Kien-An airfield Tactical aviation struck troop concentrations, equipment and cargo on highway Number 1 and in populated areas in the district of Kuang-Chat' in Kuang-Bin' province On 19 December, while repulsing attacks, air defense troops shot down six enemy aircraft (two B-52 bombers in the Khanoj [Hanoi] area and four naval aircraft over Khajfon [Haiphong])

On **20 December 1972**, American aviation conducted 336 missions (266 at night) over the territory of the DRV 93 B-52 aircraft and 8 helicopters participated in three massive air raids on Khanoj [Hanoi] and its surroundings

-- from 0500 to 0545 hours 12 B-52 aircraft and 16 F-4 and F-105 fighters attacked the railroad stations of Dong-An' and Ien-Vien,

-- from 125[0] to 1310 hours over 40 tactical aircraft repeated attacks on those stations and also attacked the populated areas of Zak-La and the airfield at Khoa-Lak,

-- from 1925 to 2100 hours 33 B-52 bombers and 32 tactical aircraft carried out strikes on the Za-Lam region (the railroad station, railcar repair factory, and airfield), the Duong bridge northeast of Khanoy [Hanoi], a railroad bridge in the area of V'et-Chi, the railroad station at Ien-Vien, and nearby populated areas

Subsequently, single F111-A aircraft struck the airfield at Bat'-Maj, air defense positions in the region of Kim-Lien, the Von-Don area (on the left bank of the Red River, south of Za-Lam), and also depots southwest of Khanoy [Hanoi] On that day 45 "Flying Fortress" B-52s and up to 90 tactical aircraft operated in the area of the capital

In a twenty-four hour period in the Khajfon [Haiphong] region, four air raids were conducted, mostly by naval aircraft (80 missions total)

-- from 0030 to 0100 thirty A-6 and A-7 aircraft struck a cement factory, a POL (petroleum, oil, and lubricants) depot, a shipyard, a pump-house, Kien-An airfield, and residential areas of Khajfon [Haiphong] and its suburbs,

-- from 0430 to 0543 ten A-6 aircraft attacked the port of Khajfon [Haiphong], the Tkhyong-Li bridge in town, and Kien-An airfield,

-- from 1755 to 1840 ten A-6 aircraft struck the Kien-An crossing and populated areas south of Khajfon [Haiphong],

-- from 2220 to 0040 on 21 Dec 72 about 30 aircraft attacked the port, a cannery and Kat-Bi airfield

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[TFR 210-39a]

From 2345 to 0030 hours on 21 December 1972, a massive air raid was carried out on the city of Bak-Zang, (the center of Kha-Bak province) by 18 B-52 bombers Two massive raids were conducted on a metallurgical factory and an electrical station in the Kao-Ngaj region (five kilometers north of Tkhaj-Nguen, province of Bak-Ikhaj)

-- from 0430 to 0600 by a force of 12 B-52s and 12 F-4 and F-105 fighters,

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-- 18 B-52 bombers and 30 F-4 and F-111A fighters operated from 2345 to 0115

In a 24 hour period, single aircraft and small groups struck En-Baj airfield, the city of Khanoj [Hanoi] and its surroundings, troop concentrations, equipment and depots at kilometer point five of highway Number 13 and kilometer point four of highway Number 7 (En-Baj area), and populated areas in the provinces of Nge-An, Kha-Bak and Nam-Kha With the goal of wearing down the air defense troops and the population of Khanoj [Hanoi], in the intervals between mass air strikes, single F-111A aircraft conducted low altitude high-speed flights over the city at 25-30 minute intervals, striking various targets

Naval helicopters conducted four raids and fired 20mm cannon and free flight rockets at depots on Khon-La island

While repulsing enemy air attacks, the PVO (air defense forces) launched more than 45 rockets and shot down 13 aircraft, including four B-52 bombers PAVN fighter aircraft were not able to operate that day due to the blockade of the airfields from the air and the unserviceable condition of the runways

On **21 December 1972** American aviation flew 190 missions (80 at night) over the territory of the DRV, including 21 B-52 missions In a 24-hour period two massive raids were conducted on Khanoj [Hanoi] and the surrounding area that lasted for a total of 1 hour and 45 minutes

-- from 0445 to 0530 hours, 21 B-52 bombers and about 40 tactical aircraft (including 6 F-111A) operated, striking Noj-Baj airfield (1,300 meters of runway were damaged by bombs dropped from six B-52 aircraft), the Dong-An' railroad station (six B-52s), the railroad station and populated areas of Za-Lam (six B-52s), and the shallows of the Red River in the northeast region of Khanoy [Hanoi] (three B-52s),

-- from 1230 to 1330 hours, about 60 F-4 and F-105 aircraft struck Khanoy [Hanoi] and Noj-Baj, Bat'-Maj and Za-Lam airfields As a result of the attacks, an electrical station and the city train station were completely destroyed, and the buildings of the Cuban, Egyptian, and Indonesian embassies were damaged, as well as residences near the station and a prison that held several captured American pilots (some of whom were wounded)

In the Khajfon [Haiphong] region and the surrounding area nine naval aircraft struck POL depots and roads around the city at 0340 and 1820 hours

During a 24-hour period, single F-111A aircraft systematically attacked the Za-Lam region, populated areas south of Khanoy [Hanoi], Tu-Din', Kuan-Nkhan, the river port of Fa-Den, a battery factory south of Khanoy [Hanoi], the Dong-An' railroad station, Noj-Baj airfield, and a POL warehouse in the populated area of Dyk-Zang During this same period tactical

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aircraft of other types singly and in small groups struck Khanoj [Hanoi], Khajfon [Haiphong], Fu-Li, V'et-Chi, bridges, crossings and populated areas in the 4th Military Zone

During combat operations, the PAVN air defense artillery launched 21 missiles and downed ten American planes (three B-52s, three F-111As, one A-7, one A-6, one F-4 and one RA-5C) PAVN fighter aviation was not able to operate because of runway damage Two Mig-21 planes took off from taxiways at the airfields of

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Noj-Baj and Za-Lam using powder accelerators However, the complex jamming situation for both ground-based guidance radars and aircraft radar sights did not permit them to be guided or to conduct battle

On **22 December 1972,** American aviation carried out 154 missions over North Vietnam (75 of them at night), including 21 B-52 missions

In a 24-hour period, two massive air raids were conducted

-- from 0300 to 0420 hours with a force of 21 B-52 bombers and 19 tactical aircraft in the area of Khanoy [Hanoi] The attacks hit the southern and southwestern outskirts of the city (the areas of Bat'-Maj, Ngaty-So, Zap-Bat), and also Za-Lam airfield (bombing by six B-52s created a continuous zone of destruction 600-800 meters wide and up to 2 kilometers long)

-- from 1330 to 1430 hours 48 F-4 and F-105 fighters struck the town of V'et-Chi

During a 24-hour period tactical aircraft (including F-111As) singly and in small groups operated with only short breaks in the Khanoy [Hanoi] region, over the towns of Khajfon [Haiphong] and Kha-Tin', En-Baj airfield, bridges, crossings and troop concentrations, equipment, cargo on the roads, and in the populated areas of the provinces of Kha-Bak, Khaj-Khyng, Tkhan'-Khoa, Kuang-Bin' and the region of Vin'-Lin'

During combat operations, air defense artillery launched ten missiles and downed four American planes (three B-52s and one F-111A) Two Mig-21 aircraft used powder accelerators to take off from the Noj-Baj and Za-Lam airfields, (one was downed in air battle and the pilot ejected)

On **23 December 1972**, U S aviation conducted 150 missions over the DRV (70 of them at night) including 18 B-52 missions

During the 24-hour period, there were two massive air raids

-- from 0526 to 0630 hours 18 B-52 bombers attacked Khajfon [Haiphong] (the POL depot , a cement factory, and the third shipyard),

-- from 1345 to 1430 hours 44 F-4 and F-105 fighters operated along the road at Shon-Taj 12-14 kilometers west of Khanoy [Hanoi] They struck the populated areas of Min'-Tkhaj, Tej-Lu and Song-Fyong

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For the remainder of the day, tactical aircraft singly and in small groups operated over the town of Dong-Khoj, Khoa-Lak airfield, railroad stations at Ti-Long and Dong-Mo (30-35 kilometers southwest of Lang-Son), troop concentrations, equipment, cargoes on the road, and populated areas in the provinces of Kha-Tej, Nam-Kha, Kuang-Nin', Tkhaj-Bin', Khaj-Khyng and Kuang-Bin'

While repulsing the attacks, the PVO (air defense forces) launched 20 missiles and shot down two B-52 bombers PAVN fighter aviation made four MiG-21 missions from Noj-Baj airfield, using powder accelerator As a result of an air battle with a quartet of F-4s, a pair of MiG-21s shot down one enemy aircraft (without loss to their side)

On **24 December 1972**, 173 American missions were conducted (151 of them at night), including 36 B-52 missions

Two massive air raids were conducted

-- from 1130 to 1230 hours 28 tactical aircraft attacked the metallurgical factory and the electrical station in the region of Tkhaj-Nguen,

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-- from 1918 to 2037 hours 36 B-52 bombers attacked the towns of Kep and Tkhaj-Nguen

Single aircraft and small groups made bombing runs throughout the 24 hour period In particular, one F-111A struck the river port of Fa-Den with high-explosive bombs Two A-6 aircraft struck the islands of Ngkhi-Son and Khon-Me, and two F-4 fighters dropped up to seven containers of cluster bombs on the pass at Li-Khoa and the river crossing at Kuan-Khau along Highway Number 1

During the course of combat activities, the PVO (air defense forces) destroyed three American aircraft, including one B-52 strategic bomber PAVN fighter aviation did not conduct military operations due to poor weather conditions (clouds and low visibility)

On **25 December 1972**, the Americans did not bomb North Vietnam because of the Christmas holiday 18 reconnaissance flights were conducted (including two high-altitude SR-71 reconnaissance aircraft and four unmanned reconnaissance aircraft)

The PVO (air defense forces) and PAVN fighter aviation did not conduct any combat operations that day

On **26 December 1972**, after a 36-hour respite, the bombing of the DRV resumed 227 aircraft participated in the missions (173 of them at night) including 63 B-52 bombers

Two massive air raids were conducted over Khanoj [Hanoi]

-- from 1315 to 1450 hours 50 tactical aircraft struck the Dong-An' rail station and residential areas of the city,

-- from 2200 to 2315 hours 36 B-52 bombers made 12 strikes on the city and the surrounding area Bombers struck heavily populated areas and suburban residential areas, a mechanical factory, a railroad depot, the Dong-An' station, a crossing over the Red River, and other objectives

15 B-52 bombers and 20 tactical aircraft operated in the Khajfon [Haiphong] region from 2210 to 2300 hours Strikes were carried out on shipyards, a POL depot, a cement factory and residential areas in the center of town From 2200 to 2250 hours 12 B-52 aircraft bombed the integrated iron and steel works, residences and surrounding villages in the Tkhaj-Nguen region There was no American air activity in the southern area of the DRV on that day

PAVN PVO (air defense forces) shot down nine aircraft that day, including eight B-52 bombers (five over Khanoy [Hanoi], two over Khajfon [Haiphong] and one in the area of Tkhaj-Nguen), using 60 rockets There was no fighter aircraft activity

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On **27 December 1972**, 372 American missions were conducted (105 at night) over DRV territory, including 51 B-52 bomber missions

In the central and northern provinces three mass air raids were conducted

-- from 1330 to 1430 hours tactical air forces in the area of Khanoy [Hanoi] (8 F-4s struck the Me-Chi radio station and the surrounding area), Khaifon (24 A-6 and A-7 aircraft bombed and strafed the port, where they sank one vessel and damaged two, Kien-An airfield, mechanical and

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cement factories, residential areas near the railroad station) and Kha-Dong, where a theater, a military base, and populated suburban areas were attacked

- From 1555 to 1635 hours, tactical aircraft (36 F-4 and F-105 fighters) attacked the city of Tu-Liem (10 kilometers west of Khanoy [Hanoi]),

- From 2230 to 2335 hours, 51 B-52 bombers and 100 tactical aircraft attacked Khanoj [Hanoi] and its suburbs The bombers attacked railway stations at Dong-An' and Ien-Vien, Za-Lam airfield, a crossing on the Red River, and suburban residential areas More than ten industrial and large residential buildings were destroyed, and Za-Lam airfield was put out of action

In the 4th Combat Zone, tactical aircraft operated alone and in small groups, striking the Kuan-Khan' railroad station, Khon-Me island, bridges, crossings, fords at Highways Number 1 and 15, troop concentrations, equipment and cargo on lines of communication, and populated sites in the provinces of Tkhan'-Khoa, Hge-An, Kha-Tin' and Kuang-Bin'

Anti-aircraft troops launched 33 rockets in a 24-hour period and shot down four B-52 bombers in the Khanoy [Hanoi] region One F-4 was downed by anti-aircraft artillery fire Fighter aviation carried out five Mig-21 sorties from Noj-Baj and Kep airfields and shot down three aircraft (one B-52 and two F-4s)

On **28 December 1972**, U S aviation flew 369 air combat missions over North Vietnam (244 of them at night), including 78 B-52 bomber missions

Three mass air strikes occurred in the northern and central provinces of the country

--From 0700 to 0745 hours, 40 F-4 and F-105 tactical fighters (of which 20 provided support for the strike aircraft) executed low-level bombing runs targeted primarily at air defense assets in Kha- Tej, Khoa-Bin' and Nin'-Bin' provinces They also attacked the power plant in Khoa-Bin',

-- From 1230 to 1340 hours, a group of 60 F-4s and F-105s attacked Khanoy [Hanoi] and air defense assets concentrated around Hanoi During the attack, 20 aircraft struck launch positions for surface-to-air missiles, air defense artillery firing positions, the Duong bridge, the Za-Lam and Ien-Bien railroad stations, the Fa-Den river port, cloth candy and tea factories, a lumberyard, an irrigation institute and residential areas The remaining aircraft provided support for the attack groups

-- From 2140 to 2235 hours, 78 B-52 bombers attacked the cities of Khanoj [Hanoi] and Dong-Mo, and roads in Kuang-Bin' province with support from 144 tactical aircraft In the Khanoy [Hanoi] region, 48 B-52 bombers escorted by 144 tactical fighters bombed the Ien-Vien, Tu-Shon and Dong-An' railroad stations, the Dong-Tyu river crossing, residential areas in the

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capital and suburban residential areas In the Dong-Mo area, bombers hit residential areas and the railroad station In Kuang-Bin' province, the bombers attacked the intersection of Highways Number 12, 15 and 20

Single F-111As, during night flights at low altitude (200-500 meters), fired on Kep airfield, the town of Bak-Zang, the Tkhaj-Nguen electrical station and a series of populated areas in the central portion of the country In the 4th Combat Zone, within a 24-hour period, tactical aviation units flew

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individually and in small groups to attack troop concentrations, equipment and cargo located at river crossings, bridges, passes, and in residential areas

In the space of 24 hours, ZRV (anti-aircraft missile forces) shot down four American aircraft, including a B-52 bomber In all, 15 rockets were expended that day Fighter aviation conducted three MiG-21 sorties from Noj-Baj airfield and downed a B-52 bomber, an F-4 fighter and a type RA-5C reconnaissance aircraft

On **29 December 1972**, American aircraft flew 206 missions over the DRV (145 of them at night), including 48 B-52 missions Two massive attacks were conducted in the central and northern regions of the country

From 0930 to 1015 hours, 40 F-4s and F-105s attacked troop concentrations, equipment and cargo at the intersection of Highways No 3 and 13a, and also populated points northwest of Tkhaj-Nguen,

-- From 2200 to 2315 hours, 33 B-52 bombers, supported by 80 tactical aircraft, bombed residential areas northeast of Tkhaj-Nguen and in the area of the Dong-Mo railroad station, and also the suburbs of Khanoy [Hanoi] 30-40 minutes after was completed, as many as 18 F-111As conducted individual low-level attacks on the same areas

In the remaining hours of the day, tactical aviation, acting singly and in small groups, attacked objectives in Khoa-Bin', Kha-Tin', Nam-Kha, Khajfon and Khuang-Bin' provinces Separate detachments of B-52s bombers bombed targets in Kuang-Bin' province In the early morning hours, a group of helicopters conducted an operation in Khoa-Bin' province to rescue crew members of aircraft that had been shot down During this operation, a helicopter was destroyed by troops of the national militia

The PAVN's ZRV (anti-aircraft missile forces) launched six missiles and shot down four aircraft, one of which was a B-52 bomber Fighters from Noj-Baj airfield conducted four missions without result

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According to data that is far from complete, during those days American aviator losses totaled 100 men Of them, more than 15 were killed, while the rest were either missing in action or taken prisoner

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Below are some examples of air combat between VNA fighters and American aircraft, and the tactics of each side

On **18 December 1971**, in the middle of the day, ground-based radars of the DRV PVO (air defense forces) detected a group (six F-4 "Fantom-2" [Phantom-2] aircraft) crossing the border of the DRV from Laos Three pairs of MiG-21PFLs were sent to intercept the targets from Noj-Baj airfield The first pair, guided to the target area by the aviation regiment's Command Post, visually detected an F-4 fighter at a distance of 10 kilometers and an altitude of 7,000 meters The leader attacked At a distance to target of 1,500 meters and a speed of 1,400 kilometers per hour, he launched two R-3s missiles at an aspect angle of 4/4 As a result of a direct hit, the F-4 aircraft was shot down and fell at a distance of 120 kilometers to the south west of Noj-Baj airfield Two American pilots ejected and were taken prisoner The pilots (a major and a lieutenant) said they were warned of the approaching North Vietnamese fighters by a DRLO (early-warning) EC-121 aircraft, but the measures they took proved insufficient They considered the late warning by the EC-121 aircraft and the suddenness of the PAVN fighter attack as the main reasons for their lack of success in combat The remaining American aircraft turned 180 degrees and headed back to Laos, trying to draw the North Vietnamese aircraft after them

Two to three minutes later, six F-4 aircraft approached the area of the air battle at an altitude of about 10,000 meters Because of a significant expenditure of fuel and loss of altitude, by command of the regimental Command Post (Noj-Baj airfield), all of the North Vietnamese fighters were withdrawn from the battle The American pilots headed in the direction of Noj-Baj airfield, planning to intercept the North Vietnamese while they were landing However, the first two pairs of North Vietnamese aircraft managed to land at Noj-Baj airfield before the American fighters occupied an air patrol zone at an altitude of 3,000-5,000 meters in the area of the turn onto base leg The third pair of MiG-21PFL aircraft, on orders of the Command Post, left for Kep airfield, where they landed

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On **19 January 1972**, the Central Command Post of the PVO-VVS (air force air defense forces) scrambled a standby pair of Mig-21PFL aircraft to intercept an airborne enemy during daylight in clear meteorological conditions 13 minutes after takeoff, at an altitude of 8,000 meters, the leader discovered ahead [illegible] by their contrails a pair of RF-101 American reconnaissance aircraft at a distance of 8-10 kilometers The North Vietnamese pilots jettisoned their auxiliary tanks, turned on their after-burners and approached with a burst of speed (at this time the pair of RF-101s had reached an altitude of 14,000 meters and changed from a right echelon formation to a left echelon)

Approaching the enemy, the wing MIG-21PFL increased speed to 1,600 kilometers/hour and outran the leader As a result, the Central Command Post directed him to turn left away from the battle and return to the airfield The leader flew to the rear of the scouts at high speed (Mach 1 4), and from a distance of 1000-1100 meters took aim through his PKI sight and launched a missile, which exploded 300 meters in front of its target In order to slow his speed, the pilot turned off the afterburner and applied the airbrakes, after which at a distance of 1800-2000 meters he launched a second missile, which hit the target and destroyed the tail section of the American aircraft

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On **6 March 1972** the Central Command Post scrambled a pair of MiG-17P fighters from Kep airfield to destroy two American aircraft Seven minutes after the planes took off the regimental Command Post more accurately determined the location of the target and advised the leader of the pair As he completed a right turn, the leader saw above him and to the left

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a pair of F-4 aircraft maneuvering to attack In order to break up the attack the leader energetically threw his aircraft into a climb In the course of this maneuver, the wingman lagged behind the leader, and noticing an F-4, shot it down As the leader came out of his maneuver, the second F-4 shot him down The Central Command Post deployed an additional pair of MiG-21PFLs to the area of the air battle After the American pilot spotted the MiG-21 aircraft, he avoided battle with the superior forces and headed towards the Gulf of Tonkin

Later, four American A-7s escorted by a flight of F-4 fighters approached one of the North Vietnamese airfields with the intention of bombing and strafing from an altitude of 1,500 meters At the same time, an RA-5C escorted by a pair of F-4s at an altitude of 5,000 meters was conducting an electronic reconnaissance flight along the border of the DRV and Laos A pair of MiG-21 fighters was dispatched to repel the attack on the airfield The wingman's takeoff was delayed by three to four minutes As a result, the aircraft entered the battle without linking up The wingman was the first to notice the enemy aircraft as they were closing on the leader In order to disrupt the potential attack, he launched two missiles ahead of the target with an aspect angle of 4/4 Having detected the missile's explosion, two A-7 aircraft turned right toward the seashore The second pair of A-7 aircraft, covered by two F-4 fighters, broke through to the airfield and dive- bombed it at an angle of 20 degrees from 1500-2000 meters As a result, the metal VPP runway was taken out of commission by the explosion of four 250-kilogram bombs

The leader of the pair of MiG-21s, left the battle without having located the enemy His wingman, out of missiles, also left the area, having already lost sight of the leader To augment their forces, a pair of MiG-21PFLs and a pair of MiG-17Fs were sent up from a neighboring airfield The MiG-21PFL aircraft formed a standing patrol above their airfield at an altitude of 4000-4500 meters, and the pair of MiG-17Fs at 800-1000 meters altitude secretly flew to the area of operations of the American ground-attack aircraft Discovering a pair of F-4 fighters from the covering force and using their advantageous position (below and behind the enemy), the MiG-17F pilots attacked using individual targeting and salvo fire from three cannons at a distance of 300-500 meters As a result of the attack, two F-4 aircraft were downed (the flight leader hit with his first salvo and the wingman with his third) The pilots left the battle separately, having lost [page ends in mid-sentence, sentence is not continued on next page]

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On **27 April 1972** at 1613 hours, a pair of MiG-21s and a flight of MiG-17s were deployed from two airfields to intercept several groups of American aircraft detected 100 kilometers east of Tkhan'-Khoa After climbing to an altitude of 4,000 meters, the MiG-21s were directed to an area near their airfield, and the MiG-17s were sent to cover Khanoy [Hanoi] near probable enemy avenues of approach

A few minutes later, the regimental command post's radar station located four enemy aircraft ten kilometers south of the airfield from which the MiG-21s took off Powerful interference forced the command post to turn over control of the MiG-21s to a visual observation post The aircraft were ordered to drop their auxiliary tanks, turn on their afterburners and close with the enemy On an intercept course and be-

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low him, the leader saw two F-4 fighters At an instrument airspeed of 800 kilometers/hour on afterburners and an altitude of 4,000 meters, he made a ten G turn (during which he lost consciousness for two or three seconds) Coming out of the turn at an altitude of 1500 meters, he discovered an enemy aircraft three kilometers ahead, locked onto it with a PKI sight and launched a missile that hit the target (the pilots ejected) The leader exited the attack by climbing and changing course The wingman did not make the turn, but turned to180 degrees level, keeping an eye on his leader After turning, he observed an F-4 on an approaching course The F-4 pilot went to afterburners, dropped his external fuel tanks and climbed to avoid combat

Success in this engagement was achieved by rapid handover of control from the command post to the visual observation post and by the skillful actions of its crew MiG-17 aircraft were not used for force augmentation in this battle

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On **10 May 1972**, the fighter aviation of the PAVN flew 64 missions (MiG-21 - 18, MiG-19 - 8, and MiG-17 - 38) and engaged in 15 aerial battles to repulse raids on the cities of Khajfon [Haiphong] and Khajzyong During these battles, seven F-4s were shot down (three by MiG-21s, three by MiG-19s, and one by a MiG-17) PAVN losses in these battles consisted of five planes -- two MiG-21s (one pilot was killed, the other ejected), two MiG-17s (one pilot was killed, the other ejected), and one MiG-19 whose engine quit after consuming all its fuel (the pilot ejected)

[text missing]

Another typical battle on this day took place while repulsing enemy raids on Khajzyong A flight of MiG-17s was sent up to intercept the enemy It flew over the city at an altitude of 300-400 meters and shot down an F-4 aircraft However, the North Vietnamese pilots became [too] engrossed in the attack of the American aircraft Attempting to bring the attack to a close

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even after losing their advantage, they weakened their watchfulness and broke formation As a result of the enemy attack, two MiG-17s were shot down (1 pilot was killed, the other ejected)

In order to augment the strength of the flight of MiG-17s, a pair of MiG-21s took off from the neighboring airfield They flew stealthily at low altitude into the area occupied by the F-4 fighters providing air cover The pilots of the MiG-21s simultaneously observed two F-4s above them about ten kilometers away Upon completing a steep climb to the altitude of the enemy aircraft, they launched one missile apiece from a range of two kilometers and shot down both American aircraft Then they dove to a minimum altitude and left the battle at high speed Correct evaluation of the aerial situation, a stealthy approach into the enemy aviation's area of operation, timely acquisition of targets and competent maneuver ensured the North Vietnamese pilots' success in the surprise attack and use of missiles

On **11 May 1972**, two pairs of MiG-21s were dispatched to repulse a raid on Khanoj [Hanoi] One of the pairs flew at an altitude of 8000-10000 meters to a region 40-50 kilometers northwest of the city in order to distract the enemy air cover The other pair flew south at low altitude in order to perform a sneak attack on the enemy from this direction (A similar approach had proved successful the previous day)

As expected, a flight of F-4s from the air cover group approached the pair of MiG-21s flying at high altitude The flight had a dispersed formation (the distance between the pairs was two to three kilometers), therefore the pilots approaching from the south detected only the lead pair of F-4s They dropped their external fuel tanks and on afterburner aggressively attacked the lead pair from below The lead MiG-21 brought down an F-4 with one missile, while his wingman shot down another with his second launch After the attack, the wingman devoted all of his attention to following his leader and did not notice the attacking aircraft of the second pair of F-4s, which shot him down with four missiles (the pilot ejected) The strike group did not meet its objective, having dropped its bombs haphazardly

The success of this battle can be attributed to a comprehensive plan of action and the use of a diversionary group However, the loss of one MiG-21 was the result of an awkward exit from the battle and the pilot's reduced watchfulness after a successful attack Also, no cover was organized for fighters leaving the battle

On **18 March 1972**, American aviation conducted more than 270 missions in different areas of the DRV To counter these attacks, VNA fighter aviation conducted 26 missions (MiG21s - eight, MiG-19s - six, MiG-17s - twelve) and conducted eight aerial engagements, during which three "Fantoms" [Phantoms] were shot down without losses on the Vietnamese side

In particular, from 1130 to 1215 hours 40 F-4s carried out mass strikes on different objectives in the region of Khanoj [Hanoi] On orders from the Central Command Post, a flight of MiG-21s was sent from Noi-Bai airfield to repulse the attacks After several minutes the regimental

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Command Post clarified the pilots' mission a surprise attack on eight loitering F-4s After a rapid ascent, the North Vietnamese pilots, in pairs, attacked the enemy planes from the rear The leader opened fire first, which caused the eight American aircraft to hastily split into flights and pairs One flight of American fighters turned sharply to the right, trying to escape the attack Using their unlucky maneuver to his advantage, the wingman

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of the North Vietnamese pair launched a guided missile and shot down an F-4 aircraft with a direct hit The leader hit a second F-4 aircraft with cannon fire, and the rest of the American aircraft fled from the battle

One of the American pilots, when taken prisoner, stated that he had been informed of the approach of the NVA fighters only two minutes before the attack In this way, the sudden attack and accurate fire of the North Vietnamese pilots ensured success in this engagement

On this day a pair of MiG-21s, sent up to break the blockade on a neighboring airfield, engaged a flight of F-4s The leader of the pair detected enemy aircraft flying in a dispersed "right echelon" formation (the distance between pairs was 300-400 meters, interval 150-200 meters), ahead and below about ten kilometers away Having informed the wingman, he dove and closed on the enemy without engaging afterburners When the target was five or six kilometers ahead, the lead pair of F-4s began a vigorous left turn, and the following pair a right half-turn The leader of the North Vietnamese pair began to follow the lead pair of F-4s, continuing to observe the action of the following pair of enemy fighters Having determined that the F-4s had returned to their previous course and did not pose a threat from below, he made a vigorous half turn toward the following pair of F-4s Coming out of the turn he attacked the wing F-4 aircraft, which was separated from its leader, and shot it down with a missile targeted by the PKI sight After this, exposed to attack by the lead pair of F-4s of which he had lost sight, the leader left the battle The wingman of the North Vietnamese pair efficiently fulfilled the commands of the leader, kept his position in the formation and supported the actions of his leader

In this battle the American pilots employed a new tactic pairs separated by a vertical maneuver for the purpose of enticing the North Vietnamese pilots to follow one pair of fighters in order to expose them to attack by the other pair However the leader of the North Vietnamese pair discerned their intent and conducted a deceptive maneuver toward the lead pair of F-4s, followed by an attack on the following pair

On **12 June 1972** a pair of MiG-21s was sent up to repulse a raid by 24 enemy aircraft approaching from Laos, and 16 carrier-based F-4 aircraft operating from the Gulf of Tonkin The enemy aircraft were in echelon by altitude from 2,000 to 7,000 meters The MiGs flew at low altitude (300-500 meters) into the area of probable enemy approach, then assumed an altitude of 5,000 meters Seven minutes after take-off, the leader detected 2 groups of enemy aircraft ahead one at a range of 10 kilometers and 6,000 meters altitude, and the other at a range of 6 kilometers and 3,000 meters altitude The two groups were flying "S" turns with banking up to 20 degrees (an anti-missile maneuver) Having given the order to drop auxiliary fuel tanks and ignite afterburners, he went on the attack at a speed of Mach 1 1 against a flight of F-4s located 2,000 meters below him His action was covered by the wingman, who remained at 5,000 meters altitude The leader launched a missile at a range of 1,200-1,300 meters and shot down an F-4 The second missile could not be used due to the high speed at which he closed with his target After this the pair of aircraft left the battle The success of this battle was made

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possible by the correctly chosen bearing for the fighters sent into the battle, and efficient and continuous guidance from the ground

On **13 June 1972** at 0845 hours PAVN radar troops detected three groups of American aircraft Southeast of Khanoi [Hanoi] on the border with Laos

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in the area of Tkhan'-Khoa province After this, interference of great intensity appeared on the screens of the RLS (radar station), making it more difficult to determine the subsequent direction of the targets' flight

Two pairs of MiG-21 aircraft took off from Noj-Baj airfield at 0902 hours The first pair flew to an area 50 kilometers northwest of Khanoj [Hanoi] at an altitude of 500 meters The second pair flew north to support the first

At 0913 hours the first pair of MiG-21s flew into the area of Fu-Tkho and, having climbed to 5,000 meters, detected four F-4 fighters off to their right on an pursuit course at a distance of ten kilometers The leader commanded his wingman to cover him and went on the attack The American pilots, having noticed the MiGs, went into a turn that gradually headed toward the border After two turns the lead MiG was left behind by the F-4s, but saw that his wingman was in a good position to attack He gave his wingman the order to attack, and provided cover himself The wingman flew at a speed of Mach 1 15 to within a distance of 1300 meters and launched a missile The enemy aircraft caught fire and fell in the area of Hoa-Lak airfield The pilot launched the second missile at 600-700 meters, but it flew past its target The pair of aircraft left the battle at the same time

The second pair of aircraft, with 1700 liters of fuel remaining, received the order to return to base En route to the airfield, at 5,000 meters altitude and with an instrument speed of 800 kilometers/hour, the pilots received the following information "Enemy planes ahead 18 kilometers " After their watchfulness, the leader detected a target (a flight of F-4s) ahead at a range of five to eight kilometers and below him at 2,000 meters Checking behind him and ensuring there was no threat to his rear, the leader dove into the attack, the wingman covered him At a speed of Mach 1 15 and a distance of 1,200 meters, the leader launched a missile An enemy plane caught fire, the pilots ejected and were taken prisoner The remaining three F-4s, increasing speed and conducting a "scissors" maneuver, flew away toward the Tonkin Gulf

In this way two F-4s were shot down in this battle using three R-3s missiles Success was made possible by

- Good flying in pairs formations,

- Skillful and competent actions of the pilots,

- Good interaction within the pairs

On **5 July 1972** 60-70 kilometers southwest of Khanoj [Hanoi] a radar station detected a group of enemy planes flying at an altitude of 3,000-5,000 meters in a "column of pairs" formation with an interval between pairs of three to five kilometers The enemy did not use jamming On orders from the Central Command Post, two pairs of MiG-21s from Noj-Baj

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airfield were sent to intercept the air target One pair returned to the airfield due to a faulty radio on the lead aircraft The second pair was directed by the crew from the regimental Command Post to the flight area of the enemy aircraft, approaching from the rear at 500-800 meters altitude (diagram 71) [not included]

At a distance of 12 kilometers on an intercept course the North Vietnamese pilots visually detected a flight of F-4 fighters, dropped their external fuel tanks and lit their afterburners (achieving a speed of 1,100 kilometers/hour according to their instruments) The MiGs closed with the wing pair of F-4s At a distance of 1,000-1,500 meters the pilots launched R-3s missiles (two missiles each) Both targets were downed Immediately after the attack the pilots descended and withdrew from the battle They returned to the airfield individually, since the wingman lost his leader at the moment of withdrawal from the attack

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In this air battle two F-4s were shot down using four R-3s missiles The success of the battle was achieved by

-The correct vectoring of fighters into battle,

-The use of the procedure of concealed approach of fighters to the attack.

-The timely detection of enemy aircraft and the speed of the attack
One deficiency that must be noted is the poor training of the pilots in group flying

On **8 Jul 1972**, 50-60 kilometers southwest of Khanoj [Hanoi], radar stations detected a group of enemy aircraft jamming acquisition and guidance radars A pair of MiG-21s was deployed by the Central Command Post from Za-Lam airfield, and directed at an altitude of 500-800 meters to the area in which the enemy aircraft were flying As a result of the jamming, information about the number of aircraft in the group and their flight formation did not reach the pilots from the Command Post

A group of eight F -4 fighters, flying in a "column of wings" formation at a distance of two to three kilometers from each other, echeloned by altitude (diagram 72) [not included] was detected by the leader on an intercept course at a distance of 15 kilometers and above him at 2,000-2,500 meters Another group of eight F-4 aircraft, following at a distance of three to five kilometers behind the first group, was detected by the wingman at a distance of 10-12 kilometers from the target

The leader of the pair commanded the wingman to attack the second group of eight, and he himself attacked the trailing flight of the first group of eight F-4s and launched an R-3s (no targets were hit) At that moment the leader of the first flight of the second group of eight F-4s turned on the leader of the North Vietnamese pair and shot him down with two missiles At the same time the North Vietnamese wingman closed with the second group of 8 F-4s, and at a range of 1 5 kilometers he launched 2 R-3s missiles at the trailing aircraft of the group and shot it down Then he withdrew from the batte with a descent toward the airfield

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On **24 July 1972** 75 kilometers southwest of Khanoj [Hanoi], a group of enemy aircraft was detected by radar stations A pair of MiG-21 aircraft was deployed by command of the Central Command Post from Noj-Baj airfield Two minutes after the first pair took off, another pair of MiG-21s was sent up from Za- 73) [not included]

The first pair was guided behind the trailing flight of the group of enemy aircraft, which consisted of 12 F-4s in dispersed formation The pair dropped external fuel tanks, and on afterburner attacked the wing pair of the trailing flight of F-4s, launching three R-3s missiles As a result of the attack both of the wing pair were shot down After the attack, the MiG-21 pair exited the battle with a sharp maneuver, descended, and left for their airfield Thanks to their skillful actions, the pair of F-4s, following at a distance of four to five kilometers and providing cover for the whole group, was unable to fend off the attack of the MiG-21s

The second pair of MiG-21's was sent by the Central Command Post to the left flank flight of the group of F-4 fighters The pair dropped external fuel tanks and on afterburner closed with the wing pair of the left flank flight of F-4s, upon whom they launched three R-3s missiles (the trailing aircraft of the F-4 flight was shot down) Then the pair maneuvered out of the battle and went back to base

In this battle the North Vietnamese fighters shot down three F-4s (firing six R-3s missiles) without loss on their side The pilots showed good group flying and coordination of action in pairs Success in aerial combat was achieved by

- the absence of jamming, which allowed uninterrupted guidance of the pilots in the air,

- clear cooperation between the Central Command Post and the pilots,

- the concealed approach of the fighters to their targets at low altitude,

- the timely detection of targets and speed of the attack

On **26 August 1972** PAVN fighter aviation flew 16 missions (12 by MiG-21s and four by MiG-17s) from Noj-Baj and Za-Lam airfields In the course of one of these battles, after making a surprise attack, the leader of a pair of MiG-21s shot down an American F-4 with two guided missiles over the province of Vin'-Fu At the same time over the province of Kha-Tai, a pair of MiG-21s downed another F-4, launching four URS (guided missiles) In the second half of the day in the Khanoj [Hanoi] area, North Vietnamese pilots in MiG-17s shot down an unmanned reconnaissance aircraft with cannon fire The leader expended 19 37-millimeter rounds and the wingman fired nine in this action

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On **7 October 1972** a pair of MiG-21PFLs was scrambled to intercept a group of F-4s proceeding toward Noj-Baj airfield during the day under clear weather conditions The pair was sent on an intercept course at 8,000 meters Six minutes into the flight the leader detected two flights of F-4s fighters below and to the left at an angle of 40 degrees at a distance of six to eight kilometers The F-4s were flying in "wedge" formation, with two to three kilometers between flights, and the second flight 1,000 – 1,500 meters lower than the first Having decided to attack the trailing flight, he did a half-turn to the left and attacked and shot down the leader of the second flight of F-4s (the missile was launched from a distance of 1,800 meters at a speed of 1,200-1300 kilometers/hour) The wingman of the North Vietnamese pair simultaneously attacked the trailing aircraft of the enemy flight and shot it down, having expended his missiles he landed at Za-Lam airfield

Detecting the attacking MiG-21PFLs, the wing pair of the second flight of F-4 fighters dropped their external fuel tanks and began a right combat turn The remaining wingman of the flight commander turned left in the direction of the first F-4 flight After completing a right combat turn, the wing pair of F-4s made a deep left spiral and again began gaining altitude with a left combat turn Pursuing them, during the second half of the left turn, the leader of the North Vietnamese pair launched a rocket at the lead F-4 aircraft from a range of 1,000 – 1,200 meters and shot it down He then vigorously turned, descended and left the battle without turning off his afterburners and landed at Za-Lam airfield The main reason for the success of the North Vietnamese pilots was the achievement of tactical surprise

On **12 October 1972,** during the day and under poor weather conditions, a pair of MiG-21PFLs was deployed by the regimental Command Post from Noj- Baj airfield to intercept a group of enemy aircraft (the weather Cloud cover – nine, lower edge of the cloud cover at 1,200 meters, upper edge at 4,000 meters, visibility ten kilometers) The aircraft were sent to an altitude of 8,000 meters The leader of the pair (the commander of the squadron of North Vietnamese fighters) detected a flight of F-4 fighters at a distance of 10-12 kilometers, flying on an intercept course at an altitude of 5,000 meters While turning toward the target, he detected two more flights of F-4s following the first by six to eight kilometers, and decided to attack the flight of F-4s at the rear of the group formation

After completing an vigorous maneuver with a descent, the leader of the North Vietnamese pair attacked and shot down the trailing aircraft of the third flight (the missile was launched from a distance of about two kilometers at a speed of 1,000 kilometers/hour) At this time the first flight of F-4s began entering the rear hemisphere of the North Vietnamese pilots at a higher altitude The leader of the pair of MiG-21PFLs, having executed a vigorous maneuver with a climb on afterburners, evaded the strike, and with afterburners still on he turned and flew into the clouds He was then able to successfully land at the airfield The wingman, who followed him into the clouds, became disoriented and ejected at a speed of 900-1,000 kilometers/hour and an altitude of 1,500-2,000 meters

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On **23 December 1972**, during the day in difficult weather conditions (cloud cover -- 10, lower edge of cloud cover -- 400 meters, upper edge -- 1,200 meters, visibility – six to eight kilometers), a pair of MiG-21s was sent from Noj-Baj airfield to intercept the enemy by order of the regimental Command Post A minute and a half after take-off, the pair proceeded under the cloud cover at an altitude of 300 meters, after which they received the order to turn right and climb to 8,000 meters At an altitude

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of 4,000 meters, the leader spotted a flight of F-4 fighters in a "wedge" formation to the right and above him Having dropped their external fuel tanks and turned on their afterburners, the pair of MIG-21s turned right and began to approach the enemy Once they were behind the flight of F-4s at a range of about 10 kilometers, the lead pair of F-4s began to turn left and the wing pair began to turn right, after jettisoning their external fuel tanks and igniting their afterburners

The leader of the North Vietnamese pair launched a rocket at the wingman of the second pair of F-4s at the same time the F-4s turned on their afterburners and began to turn right (range 1,500 –1,800 meters, speed while launching 1,200-1,250 kilometers/hour), and shot him down At this point the element of surprise was lost and the enemy planes began to actively maneuver The North Vietnamese wingman, located on the left side of the formation, was forced to fire a missile in disadvantageous conditions -- at long range (three to four kilometers) and a G-load that exceeded the maximum permitted for launching Because of this, the missile exploded behind the target After the attack, the pilots withdrew from the battle with an aggressive maneuver with a descent and landed at their airfield

On **27 December 1972** a pair of MiG-21s was scrambled from Noj-Baj airfield to intercept a group of enemy tactical fighters They were directed to an altitude of 300 meters under the clouds (cloud cover –six to seven units, lower edge of cloud cover –500 meters, upper edge –1,200 meters, visibility –ten kilometers), with intense electronic jamming conditions Having improperly understood one order from the Command Post, the pilots chose an altitude of 5,000 meters (instead of 500 meters), but after clarifying the order they dropped back under the clouds to an altitude of 200-500 meters At the moment they came out under the clouds and completed a right turn, the wingman spotted a pair of F-4 fighters to his right at a range of three kilometers At a distance of 1,800-2,000 meters, a speed of 900-950 kilometers/hour and an altitude of 200 meters, he launched an improperly aimed missile that went into the ground He launched his second missile at a range of 1,300 meters and a speed of 1,000-1,050 kilometers/hour and shot down the lead F-4 (the pilot ejected) The second F-4 climbed at the maximum rate, which allowed him to escape from the attack After the battle, the pair of MiG –21s flew back to their airbase The failure of the first missile is explained by the hasty actions of the pilot and the failure to maintain the required flight parameters for launching a missile

That night in poor weather conditions (cloud cover –ten, lower edge of clouds –400 meters, upper edge -- 2,000 meters, visibility -- ten kilometers) a single MiG-21 aircraft from En-Baj Airbase was deployed to intercept a group of B-52 bombers By command of the Central Command Post the pilot used the maximum power of his engine to climb to an altitude of 5,000 meters After that, control of the aircraft was given to the guidance center, which gave the order to jettison his auxiliary fuel tanks and climb to an altitude of 10,000 meters on afterburners While he was in the process of climbing to 6,000 meters, the pilot detected a target at an angle of 20-30 degrees above and to the left of him, flying with his indicator lights on (according to the pilot's report there were four white lights across the entire surface) Visually observing the

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target and using the information from the ground control intercept station, the pilot continued to climb at an angle of 30-40 degrees and turn left at a speed of 1,200 kilometers/hour Reaching an altitude of 10,000 meters, the pilot increased his speed to 1,300 kilometers/hour and targeted with his PKI sight From a distance of 2,000-2,500 meters (according to the ground control intercept station), he launched a volley of two missiles, which struck a B-52 aircraft The pilot disengaged from the attack by making a half-turn and resuming horizontal flight at an altitude of 2,500 - 3,000 meters, and then he returned to his airfield

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The following contributed to the success of the air campaign tactically correct formation maneuvers while approaching and attacking B-52 bombers, strict adherence to the element of surprise (the use of the collimator sight instead of radar to avoid early detection), skillful use of identification features of B-52 aircraft, precise maintenance of parameters for missile launches, and the high level of moral/psychological training of the pilots

It should be noted that before launching missiles at the B-52 bomber the pilot detected the indicator lights of another B-52 about two to three kilometers away However, he was not able to attack as he had already expended all of his missiles

On **28 December 1972** a pair of MIG-21s were scrambled from Noj-Baj airfield to repulse an attack of enemy fighters on Khanoj [Hanoi] The pair flew to the city at an altitude of 300 meters, but two minutes and thirty seconds after take-off, the regimental Command Post ordered them to drop their auxiliary fuel tanks, turn on their afterburners and increase their altitude to 5,000 meters The wingman continuously adjusted his position in the formation During one of his changes while going to a left echelon (the leader was making a right turn) the F-4 fighters at a distance of eight kilometers ahead of him With the permission of his leader the wingman attacked the flight At this moment the leader spotted another flight of "Fantoms" [Phantoms] positioning itself to attack the pair He tried to engage them, actively maneuvering both vertically and horizontally At this moment the leader could not watch his wingman's actions The leader disengaged from combat with a fuel remainder of 1,000 liters and landed at his airfield

In the air battle, the wingman downed two aircraft (F-4 and RA-5C), the pilots of which were taken prisoner However, he himself was hit while trying to break contact and ejected During his descent he was shot by the American pilots

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The sharp increase in the number of losses had a psychological effect not only on the flight crews, but also on the military high command of the aggressors Patriots often shot down aircraft and helicopters that carried high level American and South Vietnamese generals and officers conducting inspections and directing the course of combat operations For example, in the region of the Central Plateau, a helicopter was shot down (9 June 1972) with the commander of the American advisers in the 2nd Corps region, General John Vehnn, on board During a similar instance, American General R Tolmehn was killed (9 Jul 72), and a week later the commander of the 4th Air Division of the South Vietnamese Air Force, Brigadier General Nguen Khyui An` and others were killed

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